Agreed Record, Case Nos. 13,070 & 13,071.

153-47

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1891.

TERM ~~No., 92.~~ ~~10~~ ~~f.~~ 1.

WILLIAM WRIGHT, APPELLANT,

vs.

DAVID G. YUENGLING, JR.

TERM ~~No., 93.~~ ~~11~~ ~~6.~~ 2.

WILLIAM WRIGHT, APPELLANT,

vs.

JOHNSTON BEGGS.

APPEALS FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE SOUTHERN DISTRICT OF NEW YORK.

RECORDS FILED SEPTEMBER 7, 1888.
AGREED RECORD FILED MARCH 17, 1891.

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1 Supreme Court of the United States.

WILLIAM WRIGHT
vs.
DAVID G. YUENGLING, JR.

SAME
vs.
ANTHONY W. SMITH, JOHNSTON BEGGS, and JOHN D. RANKIN.

It is hereby stipulated that the record to be printed may be reduced as shown by the red-ink erasures in the annexed record, and that the following exhibits, namely, Stillman patent, King & Mulock patent, Levey patent, Swenson patent, Roberts patent, Doane patent, Sharp and Thompson patent, Estes patent, Knowles patent, and E, F, G, H, and I, may also be omitted from the record to be printed (but including pages 203 to 223, inclusive, of original transcript on file of cause Wright *v.* Yuengling, No. 416, Oct. term, 1890).

The said causes to be argued upon what remains under the rule in such case made and provided.

The answer in the suit against Beggs contains the defences in the answer of Yuengling, except in paragraph X of Yuengling, and also a full denial of infringement by either making, using, or selling.

The bills are alike except as indicated and except that the Yuengling bill charges only using and the Beggs bill making and selling also.

New York, Feb'y 17, 1891.

ANDREW J. TODD,
Of Counsel for Appellant.
B. F. LEE,
Of Counsel for Appellee.

I sign this stipulation upon the assurance that pp. 203 to 223, inclusive, referred to, include only the final decree, the opinion of the court, and the formal papers on appeal.

B. F. LEE.

2 In the Circuit Court of the United States for the Southern District of New York. In Equity.

To the honorable the judges of the circuit court of the United States for the southern district of New York:

William Wright, a resident of the city of Newburg, in the State of New York, brings this his bill of complaint against David G. Yuengling, Jr., doing busjness in the city of New York, in said southern district of New York.

And thereupon your orator complains and says that heretofore and before the 18th day of November, 1873, he was the original and first inventor of a certain new and useful improvement in frames

for horizontal engines not known or used before and not in public use or on sale for more than two years prior to his application for a patent therefor.

And your orator further shows unto your honors that, so being the inventor of said improvement in frames for horizontal engines, he made application to the proper department of the Government of the United States for letters patent in accordance with the then existing acts of Congress, and duly complied in all respects with the conditions and requirements of said acts, and that on the 18th day of November, 1873, letters patent of the United States, numbered 144,818, signed, sealed, and executed in due form of law, for the said invention or discovery were issued to your orator, whereby there was secured to your orator, his heirs, executors, administrators, or assigns, for the term of seventeen years from the said 18th day of November, 1873, the full and exclusive right of making,
3 using, and vending the said invention or discovery throughout the United States and the territories thereof; all which by said letters patent or by a duly certified copy thereof, now in possession of your orator and ready in court to be produced and shown to your honors, will more fully appear.

That your orator's aforesaid exclusive right has been generally and fully acquiesced in and acknowledged by the public, and that he has ever since the acquiring of the said right as aforesaid and now is, except for the doings of the defendant and his confederates, as hereinafter set forth, and a few other infringers of said letters patent, been in the exclusive possession and enjoyment of the right aforesaid, and that the said exclusive right has been and is of great value to your orator, to wit, the value of one hundred thousand dollars.

And that your orator will realize and receive large gains and profits therefrom if infringements thereof by the defendant and his confederates shall be prevented.

Yet the defendant, well knowing the premises and the rights secured to your orator as aforesaid by the said letters patent and utterly disregarding the same, has, at the city of New York, in violation of the rights secured by said letters patent, and has between the 18th day of November, 1873, and the date of the commencement of this suit, unlawfully used the said patented invention and has used horizontal engines in each of which was contained a frame constructed according to the said patented invention, or one or more thereof, and still continues so to do; and defendant has derived and is still deriving from such use of said invention large gains and profits, but to what amount your orator is ignorant and cannot set forth, but prays that the defendant be requested to make a
4 disclosure thereof; and your orator is greatly damaged by such wrongful acts and doings of the defendant, to wit, in the sum of ten thousand dollars.

And your orator further shows unto your honors that he will be subject to great and irreparable damage unless your honors will grant the relief hereby sought.

To the end, therefore, that the defendant may, upon oath, full,

true, direct, and perfect answer make to all and singular the matters hereinbefore stated and charged as fully and particularly as if the same were hereinafter repeated and he thereunto distinctly interrogated, according to the best of his knowledge, information, and belief;

And that the defendant, and the attorneys, agents, servants, and workmen of the defendant, may be enjoined perpetually, and also during the pendency of this suit, by writs of injunction to be issued by this honorable court, from directly or indirectly making, using, or selling the invention patented in said letters patent No. 144,818 or any material and substantial part thereof claimed therein as new;

And that the defendant may be decreed to account for and pay over to your orator all the gains and profits that have accrued to him from using said invention or any material or substantial part thereof claimed in the said letters patent No. 144,818 as new; that the dameges sustained by your orator may be assessed and the defendant be decreed to pay over to your orator, in addition to such gains and profits, the damages your orator has sustained by such unlawful acts and doings, and that the defendant be decreed to pay the costs of this suit;

And for such other and further relief as to your honors may seem meet—

May it please your honors to grant unto your honor not only the writs of injunction conformable to the prayer of this bill, but also the writ of subpœna directed to said David G. Yuengling, Jr., commanding him to appear and answer to this bill of complaint, and to do and receive what to your honors seem meet.

And your orator will ever pray.

WILLIAM WRIGHT.

A. J. TODD,
Solicitor and of Counsel for Complainant.

CITY AND COUNTY OF NEW YORK, } ss:
Southern District of New York, }

William Wright, being duly sworn, deposes and says that he is the above-named complainant; that he has read the foregoing bill of complaint subscribed by him and knows the contents thereof; that the same is true of his knowledge except as the matters therein stated to be alleged upon information and belief, and as to those matters he believes it to be true.

And he further deposes and says that he verily believes that he was and is the original and first inventor of the improvement in frames for horizontal steam-engines described in the said letters patent of the United States No. 144,818, mentioned and referred to in the foregoing bill of complaint.

WILLIAM WRIGHT.

Sworn to before me this 18th day of March, 1885.
[SEAL.] JOHN W. KONVALINKA,
Notary Public, Kings Co.

Certificate filed in N. Y. Co.

6 In the Circuit Court of the United States for the Southern District of New York.

WILLIAM WRIGHT, Complainant,
vs.
DAVID G. YUENGLING, JR., Defendant.

The answer of the defendant to the complaint of the above-named complainant or to so much and such parts thereof as he is advised that it is material for him to make answer unto, answering, says:

I. This defendant reserves to himself the benefit of all and every advantage of exception to the manifold uncertainties and insufficiencies in the said bill of complaint contained.

II. This defendant is informed and believes that letters patent of the United States, bearing date the eighteenth day of November, 1873, were issued to the complainant for an alleged new and useful improvement in frames for horizontal engines; but this defendant denies that the said William Wright was the original and first inventor of the said alleged improvement described in said letters patent, and this defendant is not informed whether in other respects the requirements of law relative to granting of letters patent were complied with by the said Wright or what, if any, proceedings were had prior to the issue of said letters patent,
7 and he therefore denies the same and leaves the plaintiff to make such proof thereof as he may be advised.

This defendant denies that the said letters patent granted or secured to said Wright any exclusive rights or privileges whatsoever.

III. This defendant denies that the exclusive right alleged to have been secured to the complainant as aforesaid has been generally and fully acquiesced in and acknowledged by the public; and, upon information and belief, denies that it has been acquiesced in by any one, and denies that the complainant has, ever since the acquiring of his alleged exclusive rights, and that he now is, except for the doings of the defendant or any other persons, in the exclusive possession and enjoyment of any right whatsoever under said letters patent, and denies that his alleged exclusive right under said letters patent has been or is of great value or of any value whatsoever to the complainant, and denies that the complainant would realize and receive large gains or profits therefrom or any gains or profits therefrom whatsoever if the alleged infringement thereof by the defendant and those alleged to be his confederates shall be prevented.

IV. This defendant denies that, knowing the premises set forth in the complaint and the alleged rights secured to the complainant by virtue of the letters patent aforesaid, he has in any manner disregarded said rights at the city of New York or elsewhere, and that

he has, in violation of any rights secured by said letters patent, at any time between the eighteenth day of November, 1873, and the date of the commencement of this suit, or at any other time, unlawfully used the said alleged patented invention, or that he has
8 used any horizontal engine or engines in each or any one of which was contained a frame constructed according to the alleged patented invention, or that he still continues so to do; and the defendant denies that he has derived or that he is still deriving from the use of said alleged invention large gains or profits or any gains or profits whatsoever; and this defendant denies that the plaintiff is greatly damaged or is at all damaged by any such alleged wrongful doings of the defendant in any sum whatsoever.

V. This defendant further denies that the plaintiff will be subject to great and irreparable damage or to any damage whatsoever unless your honors will grant the relief prayed for in his said bill of complaint.

VI. And this defendant, further answering, on information and belief says that he alleges and gives notice that on the final hearing he will prove—

First. That, for the purpose of deceiving the public, the description and specification filed by the patentee in the Patent Office was made to contain less that the whole truth relative to his invention or discovery and more than is necessary to produce the desired effect.

Second. That he surreptitiously and unjustly obtained the patent for that which was in fact invented by another, who was using reasonable diligence in adapting and perfecting the same.

Third. That the alleged invention patented under said letters patent had been patented and described in printed publications prior to the supposed invention or discovery thereof by said Wright.
9 Fourth. That said Wright was not the original and first inventor of any material and substantial part of the thing patented.

Fifth. That the thing patented had been in public use or on sale in this country for more than two years before said Wright's application for a patent, and had been abandoned to the public.

And this defendant further states that the following are the names of said patentees and the dates of their patents, and when granted, and the titles of said publications:

Letters Patent of the United States.

No. 22981, granted to Gelston Sanford February 15, 1859.

No. 540, granted to Samuel Wright December 26, 1837.

No. 112,151, granted to Henry James King and Daniel Charles Mulock February 28, 1871.

No. 124,801, granted to Chilion M. Farrar March 19, 1872.

No. 133,305, granted to Edward H. Cutler November 26, 1872.

No. 123,635, granted to James R. Maxwell and Ezra Cope February 13, 1872.

No. 133,741, granted to George H. Babcock December 10, 1872.

No. 5305, granted to Albert A. Wilson, assignor to himself and the Yale iron works, October 3, 1871.

No. 48321, granted to O. M. Stillman June 20, 1865.

No. 49334, granted to William Wright August 8, 1865.

No. 118,463, granted to Charles Levey August 29, 1871.

No. 116,454, granted to Lucius J. Knowles June 27, 1871.

10 No. 126,834, granted to George J. Roberts May 14, 1872.

No. 72820, granted to Thomas Doane December 31, 1867.

No. 108,576, granted to Philip Estes October 25, 1870.

No. 111,982, granted to Joel Sharp and Joseph W. Thompson February 21, 1871.

No. 129,996, granted to Lorens Swenson, assignor to himself and John B. Smith, July 30, 1872.

* * * * * * *

11 VII. And this defendant alleges that the said patentee has claimed as new in said letters patent more than he had a right to claim and more than that of which he was the original and first inventor and discoverer; that the complainant had full knowledge of said fact long before the filing of his bill against this defendant, and that the said complainant should have filed his disclaimer to the part or parts of the thing or things patented in said letters patent of which said Wright was not the original or first inventor or discoverer; that he has unreasonably neglected and delayed to file said disclaimer, and therefore he is not entitled to recover of this defendant any profits or damages for infringement of said letters patent or costs of suit thereupon; and this defendant claims the benefit hereof as if the same had been specially pleaded to the bill of complaint.

VIII. This defendant further alleges that in view of the state of the art the alleged improvement described and claimed in said letters patent was not in its nature the subject of letters patent of the United States.

IX. This defendant alleges that the plaintiff seeks to recover of the defendant damages in the sum of ten thousand dollars by reason of the alleged acts of the defendant set forth in the bill of complaint. This defendant demurs to all those parts of the bill that alleged damages caused to complainant by any act or acts of the defendant and which pray relief against the defendant by way of damages, on the ground that such damages are of common-law cognizance and cannot be adjudicated by this court, sitting in equity, and that this court has no jurisdiction to award damages.

12 X. That the alleged improvements claimed by the plaintiff to be secured by said letters patent affect but a small part or modification of entire machines; that the defendant is not a manufacturer of the horizontal engines complained of as embodying the alleged invention of the complainant's said letters patent, nor is he a dealer in the same; that he is engaged in business in the city of New York as a brewer, and that the engine complained of is used in his brewery for the actuating of a refrigerating machine used in the defendant's said business; that the said horizontal engine was purchased by the defendant in entire good faith and with no intent

or design to violate any rights of the complainant under said letters patent and with no knowledge of such violation, and that the defendant in no manner competes in business with the complainant; that by reason of the premises it would be improper to grant an injunction in this cause; that the defendant would suffer greater injury by reason of the injunction being granted than the plaintiff would suffer by reason of the injunction being withheld, and that no remedy peculiar to a court of equity or appropriate thereto should be awarded herein; that the plaintiff has a full, adequate, and complete remedy at law, and this court, sitting as a court of equity, has no jurisdiction to entertain this suit.

XI. This defendant, further answering, alleges on information and belief that the plaintiff has known that engines substantially the same as the engine complained of as an infringement in this suit have been built and erected and have been running and used within the United States from prior to or in the year 1872 continuously to the present time, with the acquiescence of the complainant and without any license under his letters patent, and that
13 some of such engines were so built by the predecessors in business of the Smith, Beggs & Ranken Machine Company of St. Louis, Missouri, prior to or in the year 1872, who manufactured the machines used by defendant and complained of as an infringement herein, of all of which this complainant was and has been continuously well aware from in or before the year 1872 to the present time, and that said use began before the date of the complainant's application for his said patent, and that, by reason of the premises, if the said letters patent, under any circumstances, gave to the complainant any exclusive rights, which this defendant denies, the complainant is estopped from now claiming a recovery of profits or damages or an injunction by reason of any of the acts of the defendant as hereinbefore set forth, and that, by reason of the premises, the complainant has precluded himself from obtaining equitable relief and has dedicated his said invention to the public.

XII. This defendant, further answering, denies each and every other allegation in the said bill of complaint not heretofore admitted, controverted, or denied, and without this, that any other matter or thing in the said bill of complaint contained material or necessary to make answer unto and not herein and hereby well and sufficiently answered unto, confessed and avoided, traversed or denied, is true to the knowledge or belief of this defendant; all of which this defendant is willing to aver, maintain, and prove as this honorable court shall direct, and prays to be hence dismissed with his reasonable costs and charges in this behalf most wrongfully sustained.

DAVID G. YUENGLING, JR.

TURNER, LEE & McCLURE,
Defendant's Solicitors.
B. F. LEE, *Of Counsel.*

14 SOUTHERN DISTRICT OF NEW YORK, } ss:
City and County of New York, }

On this twenty-fourth day of November, 1885, before me personally came David G. Youngling, Jr., the defendant named in the foregoing answer and who has signed the same, and he, being by me duly sworn, said that he had read the said answer and knew the contents thereof, and that the same was true of his own knowledge except as to the matters therein stated to be alleged on information and belief, and that as to those matters he believed it to be true.

[SEAL.] JOHN McCLURE,
Notary Public, N. Y. Co.

Replication filed January 4th, 1886.

15 In the Circuit Court of the United States for the Southern District of New York. In Equity.

To the honorable the judges of the circuit court of the United States for the southern district of New York:

William Wright, a resident of the city of Newburgh, in the State of New York, brings this his bill of complaint against Anthony W. Smith, Johnston Beggs, and John D. Ranken, doing business under the firm name and style of Smith, Beggs & Ranken Machine Company, at the city of St. Louis, in the State of Missouri.

* * * * * * *

16 In the Circuit Court of the United States for the Southern District of New York.

WILLIAM WRIGHT, Complainant,
vs.
JOHNSTON BEGGS, Impleaded with Others, Defendant.

The answer of the defendant, Johnston Beggs, to the complaint of the above-named complainant, or to so much and such parts thereof as he is advised that it is material for him to make answer unto, answering, says:

* * * * * * *

17 X. This defendant, further answering, says that the machines complained of as an infringement of the letters patent upon which this suit was brought were not made, used, or sold by this defendant, but were made and sold by the Smith, Beggs and Ranken Machine Company, a corporation duly created and existing by and under the laws of the State of Missouri, at the city of St. Louis, in said State, and that said corporation is alone responsible to the complainant for all the acts, matters, and things complained of in said suit, and this defendant denies that said machines, so made by said corporation, are made in violation of any rights of the complainant under and by virtue of said letters patent or otherwise.

* * * * * * *

18 U. S. Circuit Court, Southern District of New York.

WILLIAM WRIGHT
vs.
DAVID G. YUENGLING, JR. } In Equity.

SAME
vs.
JOHNSTON BEGGS *et al.* } In Equity.

Testimony taken for final hearing on the part of complainant, under the 69th rule of the equity rules, as amended, before John A. Shields, Esq., as examiner.

Present: Mr. A. J. Todd, for complainant; Mr. Frederick Geller, for defendants.

Counsel for complainant offers in evidence letters patent of United States, granted to William Wright for improvement in frames for horizontal engines, dated November 18th, 1873, and numbered 144,818.

Counsel for defendant agrees that a Patent Office copy of the specifications and drawings be substituted in place of said
19 original patent, which copy is here marked Complainant's Exhibit A.

Also offers in evidence a model of the Wright patented structure, which is marked Complainant's Exhibit Wright Model B.

Objected to as not properly proved.

Also offers in evidence a model of the infringing structure, which is marked Complainant's Exhibit Infringing Engine Frame C.

Objected to as not properly proved.

JAMES K. WRIGHT, a witness for complainant, being duly sworn, testifies as follows:

Direct examination by Mr. TODD:

Q. 1. What is your name, age, residence, and occupation?

A. James K. Wright; 40 years old; Newburg, Orange county, New York; I am general superintendent for William Wright, Newburg.

Q. 2. Did you, at any time, visit the defendant's place of business, David G. Yuengling, Jr., at the upper part of the city of New York, to examine the engine frames there used; if so, when first, and how often before the bill was filed in the case of said Yuengling, did you see said engine frames?

A. I can't tell exactly the date when I first was there, but it was over a year ago when I was there first, and I have been in to see them, prior to filing the bill, maybe three or four times. It was last year, before the month of March—certainly twice before the month of March.

20 Q. 3. Please examine model marked "Complainant's Ex. Infringing Engine Frame C" and state how it compares or differs from the engine frames which you so saw in the year 1885, prior to the month of March, at said Yuengling's place of business.

A. This is an exact model of the frames that I saw at Yuengling's.

Q. 4. Why do you know that it is an exact model?

A. Because I made a sketch of the frame when I was there, in part. I ordered the model to be made, and after it was completed compared it with the frames in Yuengling's brewery, and found, with one exception, them to be fac-similes, the exception that I noticed. I altered my model to conform in every respect with the frames at Yeungling's brewery, making the model, as altered and as it now appears, so as to correctly represent the frames at Yuengling's.

Q. 5. Have you read the specification and claims and examined the drawings of Complainant's Exhibit C, and do you believe you understand the same?

Objected to because witness is not shown to be competent to answer such a question.

A. Yes, sir; and I believe I do.

Q. 6. Please examine the model, Complainant's Ex. Wright Model B, and state what it represents.

Same objection.

A. It represents William Wright's patented structure, as set forth in his patent November 18th, 1873, No. 144,818 here in suit. This model was made under my directions.

21 Q. 7. Please compare the model, Exhibit C, with the three claims of said Wright patent, Ex. A, and state whether you find in said model, Ex. C, the elements claimed in these claims respectively.

Same objection as to Q. 5.

A. First. I find that the first claim of the Wright patent covers the cylinder *b* for guiding the cross-head, a cylinder head, *a*, and a semi-circular connecting piece, *d*.

I find these three elements embodied in the model and in the frames which I saw at Yuengling's.

Second. I find that the second claim of the Wright patent covers the combination in a horizontal engine frame of the guiding cylinder *b*, base H, and trough-like connection D between the two.

I find these three elements embodied in the model and in the frames which I saw at Yuengling's.

Third. I find that the third claim covers in a horizontal engine frame a cylinder head, *a*, guiding cylinder *b*, connecting piece *d*, trough D, base H, and web *t*.

I find these elements embodied in the model and in the frames which I saw at Yuengling's, and all combined therein, precisely in the manner described in the specifications.

As to the connecting piece in the first and third claims, marked *d* in the Wright patent and model B, the opening for access to the piston-rod stuffing box is shown on top, while in defendant's model, marked C, and in the frames at Yuengling's brewery the said opening is at the side. The opening of the side answers the same pur-

pose. In the engines we build under the Wright patent the opening is always at the side.

Q. 8. Do you know who made these engine frames you saw at Yuengling's brewery?

22 A. Mr. Johnston Beggs, when he was here last summer, not only gave these in the list of engine frames that he had made, but numerous others. Smith, Beggs & Rankin's name-plate was on the engine.

Adjourned to Feb. 3, at 1½ p. m.

Q. 12. State what has been your familiarity with mechanics, generally considered, and, more especially, what has been your familiarity with the patented structure of William Wright's here in controversy.

A. My familiarity with mechanics consists in learning the machinist's and draughtsman's profession and in practising it to the present time from 1861, when I learned my trade, and in regard to the Wright patent frame I have to say that I made the original drawings for the said frame, and I have been general superintendent of Mr. Wright's shop, where they have been made, up to the present time.

Q. 13. Have you had occasion to look at and examine other engine frames than the frame represented by model, Exhibit C, in this case, which were claimed to be infringements of the Wright patent here in controversy?

A. In addition to the ones at Yuengling's brewery I saw two separate engines running in St. Louis that had similar frames.

Q. 14. Did you examine said two engine frames in St. Louis with a view of satisfying your mind as to whether they infringed the Wright patent here in this suit?

A. Yes; I examined them with a view of seeing if there was any difference in their construction from the beds or frames that I had seen previously in Yuengling's brewery, and I found them to be identical. I examined them with the view stated in the question. That was a part of my business in St. Louis.

23 Cross-examination by WILLIAM H. L. LEE, Esq.:

X Q. 15. You have stated that you made the original drawings for the Wright patent frame. Please state when and where you made such drawings, and state also whether you had anything else to do with the alleged invention of the patent in suit prior to the application therefor other than what you have already stated.

Complainant's counsel has no objection to the witness answering whether he made these drawings either before or after the application filed, but he does object to the witness stating the date, if before the application filed, as not in proper cross-examination on the making of complainant's *prima facie* case, as such is immaterial and irrelevant and improper subject-matter of examination at this stage of the case, and the witness is instructed not to give any date of

making if the drawings were made before the date of application, except to state such fact, if before.

A. I made the drawing before the application for the patent, and I had nothing to do with the patent otherwise than making the drawings.

X Q. 16. Where did you make these drawings referred to?

Objected to as immaterial.

A. In New York city.

X Q. 18. During the period that you have been engaged in practicing the machinists' and draughtsman's profession and prior to the time that you first knew of the frame like that in suit did you have a general knowledge of such engine frames as were in use?

24 A. Yes, sir; I had a general knowledge.

X Q. 19. What is the advantage of the combination in the first claim of the patent in suit over what existed prior to the time that you first knew of the engine frame of the complainant's patent?

Question objected to as indefinite and unnecessarily double, the question being proper and correct up to and including the words "patent in suit."

A. Strength, durability, and cheapness.

X Q. 20. To what is this strength, durability, and cheapness due?

A. The strength is due to having the front end of the cylinder connected with the slide in a cylindrical shape coincident with the centre of the cylinder; the durability consists in insuring the cross-head to be always in line with the cylinder; the cheapness consists in less work to construct the slides than in the old method.

X Q. 21. Do you mean to say that prior to the time that you first knew of the structure of the patent in suit that you did not know of a cylinder guide in an engine frame?

Objected to as improper on cross-examination and as not responsive whatever to anything on the direct examination.

A. I had no knowledge of anything of the kind.

X Q. 22. Did you not know prior to the time that you first knew of the structure of the patent in suit of a rigid connection between the guide of the cross-head of any construction and the cylinder head?

Same objections and as indefinite.

A. I had knowledge of what is known as the Corliss
25 engine frame. That is the only one I can call to mind.

X Q. 23. What was the nature of the cross-head guide in the Corliss engine frame?

Same objections.

A. The Corliss engine frame is constructed with V-shaped slides, open in front.

X Q. 24. Was there any special difference between the rigid connection in the Corliss engine frame and that shown in the patent in suit?

Same objections.

A. The difference consists in the slides in the Wright frame being connected both front and back, the Corliss engine frame being connected only at the back side or pillow-block side.

X Q. 25. Will not any rigid connection answer the purpose just as well, provided it has sufficient strength, regardless of its shape?

Same objections and as indefinite and hypothetical, no alleged prior structure being definitely referred to in the question.

A. My opinion is that you cannot put metal in any stronger form than in a cylindrical shape.

Answer objected to by defendant's counsel as irresponsive.

X Q. 26. Question repeated.

Objections continued, and, further, as substantially answered.

26 A. Why, if you can devise any shape to insure the same strength, it would answer the same purpose.

X Q. 27. Suppose a rigid connection of an entirely different shape and which was just as strong, would it not answer the purpose just as well as the rigid connection of the patent?

Same objections and as referring to something which, so far as the question is concerned, is not in existence before us in any tangible shape.

The counsel is requested to give to the witness the shape of the other construction to which reference is made, so that the witness can intelligently answer the question if a further answer is insisted upon as is given in the last two answers to substantially the same question.

Counsel for defendant declines to change his question.

A. If a shape could be devised that would combine the same strength it would answer the same purpose.

Answer objected to as irresponsive.

X Q. 28. Point out and indicate by some permanent mark on the structure, Complainant's Exhibit C, the exact boundaries of the connecting piece *d*, which you say is shown in the Exhibit C referred to.

A. The connecting piece, as referred to by letter *d* in the Wright frame patent drawing, is substantially covered, in my opinion, by the connecting piece in model C, as shown between arrow
27 heads on said model. The exact point of beginning is supposed to be at the end of the slides.

X Q. 29. When you say it is between the arrow heads you mean, do you not, that it includes the entire space between the points of the two arrows which are represented as pointing in a line in opposite directions from each other?

A. The space included is from the point of the ending of the slides and front face of cylinder, and is supposed to be covered by the arrow heads marked on the model and running in opposite directions.

X Q. 30. Now, in regard to the second claim of the patent, what advantage do you deem that there is in the mechanism therein claimed over what existed prior to the time you first knew of the structure of the patent?

A. In the increased strength and cheapness.

X Q. 31. In what respects and for what reasons has it increased strength?

A. The increased strength consists in connecting the main bearing of the engine with the slide by the continuous trough-like connection.

X Q. 32. Can you not explain more fully to what this increased strength which you claim is due?

A. Well, it's due to the general distribution of the metal in the said trough-like connection, which forms a brace between the bearing and slide on both sides of the crank.

X Q. 33. You say the general distribution. Can you not explain that more fully?

A. I think the forming of the brace upon both sides of the crank, as described above, is as clear as I can make it.

X Q. 34. Then, as to the causes of its advantages, utility and cheapness, you can give no further explanation than you have already done. Is that so?

A. Well, the cause of its cheapness lies in less cost to con-
28 struct. As to its utility and strength, I can give no further reasons.

X Q. 35. When you speak of its cheapness with what do you compare it?

A. I compare it with a former frame made by William Wright, in which the brace was made of wrought iron at much greater cost.

X Q. 36. Then you confine yourself to what was done by William Wright. Is that so?

A. No, sir; I do not.

X Q. 37. Then have you anything to correct in your answer to cross-question 31?

Objected to as an improper assumption that witness has made an incorrect answer.

A. My knowledge as to the cost of a wrought-iron brace, as compared with the frame in question, was confined to William Wright, but I am aware that other styles of frames were made at that time at much greater cost, in my opinion.

X Q. 38. As to the cost being greater, then, of the other styles of frame not made by William Wright, it is a matter of opinion and not of personal knowledge, is it not?

A. I had no personal knowledge of the cost of any frame made by any one except William Wright.

X Q. 39. Now, turning to the third claim of the patent, please

state what, in your opinion, are the advantages of the alleged invention therein claimed.

A. Great strength and cheapness to construct the same.

X Q. 40. Explain wherein the great strength lies.

A. It consists in forming a brace between the cylinder and the crank-shaft bearing in line with the centre of the cylinder.

29 X Q. 41. Have you ever had anything to do with the construction of vertical engines?

Objected to as not in cross-examination and as irrelevant and immaterial.

A. Very little. I have made a few drawings for vertical engines, but have never superintended their construction.

X Q. 42. Were such drawings made for the purpose of being used by others for the practical construction of a vertical engine?

A. Yes, sir.

X Q. 43. And were engines so constructed from such drawings?

Same objection.

A. Yes, sir.

X Q. 46. You spoke of having seen two engines in St. Louis in your answer to question 14. Please state when you saw these two engines, and where.

A. I was in St. Louis New Year's day, in 1885, and I saw one in the Lindell hotel, and the other, I think, was in a rice mill, all in St. Louis.

X Q. 47. The cylinder guide in Complainant's Exhibit B is supposed to be circular, is it not—that is, that a vertical section of the same cut at right angles to the line of the cylinder guide would be a circle?

A. If the section was made at the point where there were no openings, front or back, it would show an entire section of the metal in a circle.

The further examination of this witness is adjourned until the next day after the hearing of and decision made on the motion herein noticed for the 12th of February, 1886, at 2 o'clock p. m.

30 NEW YORK, *March* 17, 1886—2.30 p. m.

Met pursuant to adjournment.

Present: Counsel as before.

Cross-examination of the witness, JAMES K. WRIGHT, continued:

X Q. 49. In answer to X Q. 20 you say that the strength of the engine frame shown in the patent of Wright is due to having the front end of the cylinder connected with the slide in a cylindrical shape coincident with the centre of the cylinder. Will you please explain wherein the increased strength lies by the use of the structure referred to, and also explain why equal strength was not attained by the use of engine frames well known prior to the complainant's patented frame?

Complainant's counsel objects to the last clause of the question as not in cross-examination, too general and indefinite, and the witness is instructed not to answer the same.

The first part of the question is objected to because it contains a misstatement, the witness in his answer only referring to the advantage of the combination contained in the first claim and not to the engine frame as a whole.

A. This strength is due to having the connection made in a cylindrical shape, thereby forming a connection on both sides, front and rear.

X Q. 52. In your answer to X Q. 20 you say that durability consists in insuring the cross-head to be always in line with the cylinder. Explain why this fact causes greater durability.

A. Because, it insures more even wear.

X Q. 53. Why does it insure more even wear?

A. Because, the slides being bored and having a centre co-
31 incident with the centre of the cylinder, the steam-piston and cross-head will more naturally keep in the same line.

X Q. 54. And if, as a matter of fact, the steam-piston and cross-head did not keep more perfectly in the same line, there would be no greater durability, would there?

A. If, as a matter of fact, the cross-head was out of line with the cylinder there would be a greater wear.

X Q. 55. You stated in answer to X Q. 20 that the cheapness consists in less work to construct the slides. Explain why there is less work.

A. The slides in the Wright patented frame are completed when they are bored out, and this mode of finishing work is much cheaper than planing or work by hand. Another reason why it is cheaper consists in less handling to finish the slides in this manner.

X Q. 56. Why is there less handling?

A. Because a slide that is finished by planing has to be handled in order to reverse the frame on the planer to finish the opposite side. By reverse I mean to turn on the opposite side.

X Q. 57. What special virtue is there in the cylinder connected with the slide in a cylindrical shape coincident with the centre of the cylinder as affecting the strength of the frame?

A. The more rigid you can connect the cylinder with the engine frame the stronger it will be, and this connection, as shown in the Wright frame, being of a cylindrical form, in my opinion is the strongest way of making the connection.

X Q. 58. Explain why it is the strongest way of making the connection.

A. Because it is in a cylindrical form.

X Q. 59. You think, then, there is an especial virtue in the cylindrical form?

Objected to as immaterial what the witness thinks, as the patent shows it and the defendants use it.

32 A. In my opinion there is.

X Q. 60. Apart from the modifications in the form of the

frame the engine to which the frame is designed to be applied is an ordinary horizontal engine, is it not, such as — been known for many years prior to the time of the complainant's invention?

A. The frame is designed to be used on a horizontal engine of any type.

X Q. 61. Horizontal engines are much older than complainant's invention, are they not?

A. Engines made to run in a horizontal position are much older than this Wright frame.

X Q. 63. In Q. 2 you were asked whether you had visited the place of business of the defendant David G. Yuengling, Jr., and your answer was to the effect that you had visited said place of business. Please state the nature of the business carried on by said Yuengling at said place when you visited it.

Objected to as immaterial.

A. In a general way I supposed it was a lager-beer brewery.

X Q. 64. The said David G. Yuengling is not engaged in manufacturing horizontal engines or in any similar business so far as you know, is he?

A. No; not that I know of.

X Q. 65. Your business is such that you would know it if it was a fact, is it not?

A. No, sir; I don't think I would.

JAS. K. WRIGHT.

Sworn before me—

JOHN A. SHIELDS, *Examiner.*

On the 24th day of March, 1886, counsel for complainant notifies defendants' counsel that complainant rests.

* * * * * * *

33 *Testimony for Defendants.*

NEW YORK, *January* 15, 1887.

Met pursuant to notice.

Present: B. F. Lee, Esq., counsel for defendant; A. J. Todd, Esq., counsel for complainant.

It is agreed between counsel for complainant and defendant that the following affidavit of Anthony W. Smith, sworn to January 12, 1887, before Louis Rosenbaum, notary public, at St Louis, Mo., shall be taken and considered as a deposition in this cause, and may be read in evidence accordingly, and said affidavit is here inserted and made part of this record.

34 U. S. Circuit Court, Southern District of New York.

WILLIAM WRIGHT
vs.
DAVID G. YUENGLING, JR.

SAME
vs.
JOHNSTON BEGGS, Impleaded, &c.

DISTRICT OF MISSOURI, CITY OF ST. LOUIS, } ss:
State of Missouri,

Anthony W. Smith, vice-president and acting president Smith, Beggs & Ranken Machine Co., being duly sworn, deposes and says as follows:

I am a member of the corporation of Smith, Beggs & Ranken Machine Company, doing business in St. Louis, Missouri. I am acquainted with the method of constructing engines employed by this corporation. I am familiar with the engine put in the brewery of David G. Yuengling, Jr., Manhattanville, New York. In constructing such engines we proceed as follows: The frame, without the cylinder, is cast, and where the cross-head is to bear fitting strips are provided at the top and bottom of the frame adjacent to the cylinder. A boring bar is then adjusted upon centers, and the said fitting strips are bored, thus forming the guides, and at the same operation the end of the frame is faced up so as to bring the end of the frame at right angles with the guides. While this is being done the cylinder is bored by a boring bar in another
35 machine, the operation of which consists in boring the cylinder and facing its flanges. An annular projecting ring is left upon the front of the cylinder, which enters the end of the frame, so that the cylinder may be brought central with the guides. Meanwhile the cylinder head and stuffing box are turned up in another machine. The parts are then put together, and in some cases they will be found to be in perfect alignment and in othes cases with the same exercise of care the spring of the tools will leave the work not quite true, and to obtain exact alignment the front of the cylinder or the end of the frame will have to be scraped for the purpose of obtaining the necessary truth of cylinders and guides. In no case do we bore out the cylinders when bolted to the frame. The engine and compresser at Yuengling's brewery, which are the subject of the above-entitled suit against Yuengling, were made and fitted in the manner above described.

ANTHONY W. SMITH,
Vice and Acting President Smith, Beggs & Ranken Machine Co.

Sworn and subscribed to before me this 12th day of January, 1887.

LEWIS ROSENBAUM,
Notary Public, City of St. Louis, Mo.

Counsel for defendant offers in evidence a certified copy of the model filed in the U. S. Patent Office in the matter of the letters patent granted William Wright November 18th, 1873, No. 144,818, for improvement in frames for horizontal engines, and the same is marked "Defendants' Ex. Patent Office Model."

J. A. S., *Ex'r.*

36 WILLIAM E. CARLILE, being produced and duly sworn as a witness on behalf of defendants, testifies as follows:

Q. 1. What is your name, age, residence, and occupation?

A. William E. Carlile; age, 54; reside in New York city; occupation, mechanical engineer; place of business, No. 2 College place.

Q. 2. Have you ever examined steam-engines and steam-engine frames? And state in a general way what your experience has been in reference to such structures.

A. I have examined many engines and engine frames in my life; indeed, the business of my life has been the designing, constructing, and working of steam machinery.

Q. 3. Have you ever examined a steam-engine and frame, and also a refrigerating machine and frame, at the brewery of David G. Yuengling, Jr.? And, if so, state whether you understand the construction of such frame.

A. I have examined the engine and refrigerating machine at Yuengling's brewery, and I think I understand their construction perfectly. I have examined the engine and refrigerating machine referred to three or four times. The last examination was a very careful one, for at that time I took sketches from which to make a model.

Q. 4. Have you compared the said structures in Mr. Yuengling's brewery with "Complainant'- Ex. Model Infringing Machine C"?

A. I have.

Q. 5. State whether or not you found that said model correctly represented the structures that you have just spoken of as being in Mr. Yuengling's brewery.

A. I only found it partly correct. The model is correct from the crank end up to the guiding cylinder; the rest of it is not.

37 Q. 6. Have you made or caused to be made a correct model of that part of the structures at Mr. Yuengling's brewery that you found to be incorrectly represented by "Complainant's Exhibit Model of Infringing Machine C"?

A. I have made a model which I consider to be a correct representation of that part of the structure referred to, which I consider to be incorrectly represented by the "Complainant's Exhibit Model of Infringing Machine C" referred to in the question.

Q. 7. Will you please produce the model that you made, referred to in the last answer?

A. Here is the model.

The model referred to by the witness is offered in evidence and marked "Defendants' Ex. Correct Yuengling Model."

J. A. S., *Ex'r.*

Q. 8. Please state where the casting forming the engine frame ends in the structures at Yuengling's brewery; I refer to the end furthest from the pillar block.

A. The end referred to ends in a flange, which flange is bolted to the cylinder.

Q. 9. State whether or not in said Yuengling structures the cylinder head forms part of the casting of the engine frame.

A. In the Yuengling structure the cylinder head and the frame are entirely separate castings.

Q. 10. In the model that you have produced, marked Defendants' Exhibit Correct Yuengling Model, I observe two screw-bolts at the end of the casting forming the frame; what is the office of those bolts, and will you please unscrew them and replace them?

A. The office of those bolts, of which there would proba-
38 bly be eight, and of which I have only shown two, is to bolt, to fasten the cylinder casting to the engine-frame casting. I have taken these bolts out as desired.

Q. 11. Please state what is now comprised in each of the two parts into which you have now separated Defendants' Exhibit Correct Yuengling Model.

A. One piece comprises part of the cylinder; also a square casting, which is one and the same casting with the cylinder, which square casting is the steam-chest in which the steam-valves are located.

Q. 12. Where is the cylinder head represented in said model?

A. The cylinder head is part of the same casting with the cylinder and the steam-chest.

Cross-examined by Mr. TODD:

X Q. 13. Does not the model Exhibit Model of Infringing Structure C show the cylinder or cylinder head and the engine frame in entirely separate castings?

A. I cannot see any cylinder head on this model.

X Q. 14. Don't you find something in that model C that represents the cylinder head?

A. I find something that may have been intended to represent it.

X Q. 15. Now, in the light of your last answer, please answer X Q. 13.

A. It does.

X Q. 16. You have stated that the model C correctly represents the Yuengling engine frame from the crank end up to the guiding cylinder. Now, please state what you find incorrect in the guiding cylinder of the model C. Please confine your answer to the model C and the Yuengling engine frame.

A. I find, in the first place, there is a large swell on that part of

the frame which adjoins the cylinder on the model C, which
39 swell is not found on the Yuengling engine frames. In the second place, the flange by which the engine frame is bolted to the cylinder in the model C is in the inside of the frame, while the flange which bolts the frame of Yuengling's engine to its cylinder is on the outside. In the third place, the support which is under that end of the frame adjacent to the cylinder in model C is solid or nearly so, while in Yuengling's engine itself it is hollow. I don't see any more differences.

X Q. 17. If, as you state, the cylinder head, cylinder, and steam-chest casting is all in one casting, how is the cylinder bored out?

A. The cylinder is bored out by means of a bar which carries a tool, said bar passing through a hole in the cylinder head, which hole is afterwards filled up by a piece in which the stuffing box for the piston-rod is located.

X Q. 18. But this hole is not shown large enough in the model, is it, for the insertion of the bar and tool?

A. I think it is shown large enough for the insertion of the bar without the tool. It is not necessary that it should be large enough for the insertion of the tool with which the cylinder is bored out.

X Q. 19. Is not this hole shown of the diameter of the gland of the stuffing box?

A. I really could not tell, but it appears to be a shade larger.

X Q. 20. Will you testify positively that such a diameter of hole would be large enough to admit of getting a proper boring tool through for the purpose of boring out the steam cylinder?

A. I will testify most positively and decidedly.

X Q. 21. Has this model which has been introduced in evidence as correct Yuengling model been made to a scale?

A. It has been made to a scale.

40 X Q. 22. Did you measure the opening in the cylinder head of the Yuengling engine through which the boring tool was introduced for the purpose of boring out the steam cylinder?

A. I did not; I had not access to it.

X Q. 23. Then, this opening in the cylinder head of Defendants' Exhibit Correct Yuengling Model is not drawn to a scale, is it, and does not correctly represent the cylinder head of the Yuengling engine frames in question?

A. It is not drawn to a scale because, as I have already said, I had not access to it to measure it; but from my knowledge as a mechanic, and knowing that the object of the hole being left in the cylinder head was for the purpose of admitting a boring bar, and knowing that a boring bar should be of a certain size or about a certain size to properly bore out the Yuengling cylinder, I left the hole of such a size as I thought necessary.

X Q. 24. Then, this cylinder-head part of the engine frame in Defendants' Exhibit Correct Yuengling Model may be correct and it may be incorrect, so far as you know; in other words, that this part of the model was a matter of guess-work?

A. The cylinder head is not part of the frame, as I have before stated.

Redirect:

R. D. Q. 25. Please observe the rib that bounds what you have called the swelled portion next to the cylinder in Complainant's Exhibit Model of Infringing Structure C, said rib being at that end of the swelled portion furthest from the cylinder, and state where the corresponding part is in the Yuengling structures.

Objected to as immaterial.

41 A. I have examined the rib you refer to on model C, and there is no corresponding protrusion on the Yuengling engine.

R. D. Q. 26. Referring to X Q. 20, please explain what you understand to be meant by "boring tool" in that question and answer.

A. I understand a boring tool in this connection to be a bar fitted with a cutting tool ready for work.

R. D. Q. 27. Do you mean, then, by your answer to X Q. 20 that the hole is big enough to allow both bar and cutting tool to pass through it?

A. I do not.

R. D. Q. 28. Please explain this in connection with your answer to X Q. 20.

A. A bar may be called a tool when spoken of by itself, but when spoken of as ready to go to work and bore out a cylinder, then I would only call it part of the necessary instrument or tool for performing that operation. In speaking of the size of the hole left in the cylinder casting, what I meant in answer to X Q. 20 was that the hole should be left of such size as to admit the bar alone. In that connection I spoke of the bar as the tool.

R. D. Q. 29. Refer to Complainant's Exhibit Model of Infringing Structure C and compare it with Defendant's Exhibit Yuengling Correct Model in respect to their accuracy in regard to details in which they purport to represent the structures at Yuengling's brewery.

Objected to as immaterial and as already fully answered.

A. I have compared the models referred to, and I find that the shape of the openings are different. I consider the defendant's exhibit is much more correct as to details. All I can say is that "Complainant's Ex. Model C" is a most imperfect and inaccurate representation of Yuengling's engine in matters of detail.

42 Referring to Defendant's "Ex. Correct Yuengling Model," although I do not pretend that it is a Chinese copy, I do consider it much more correct in matters of detail than "Complainant's Ex. Model C."

That part of answer commencing with "All I can say is" down to "matters of detail" objected to as prejudiced conclusion on the part of the witness without giving the facts on which to permit of the court drawing a conclusion and as wholly inconsistent with the witness' answer to X Q. 16 in which he described all the differences that he

could see. The court's attention is particularly called to answer to X Q. 16.

R. D. Q. 31. Will you please restore the model which you have produced by fastening the parts together that were detached at an earlier stage of your examination?

A. I have done so.

R. D. — 32. So far as said model which you made purports to represent the Yuengling structure, state whether or not, in matters of detail, it is a correct copy to a scale of those parts of the structure at Yuengling's which are exposed to view.

Objected to as already fully and sufficiently answered and as calling for an unnecessary repetition of the witness' views.

A. I think it is substantially correct.

Recross:

R. D. Q. 33. Why did you not make a model of the whole engine frame?

A. Because I was not told to.

W. E. CARLILE.

Adjourned to Saturday, January 22nd inst., at 11 a. m.

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43 U. S. Circuit Court, Southern District of New York.

WILLIAM WRIGHT
vs.
JOHNSTON BEGGS, Impleaded, &c.

WILLIAM WRIGHT
vs.
DAVID G. YUENGLING, JR.

Testimony taken on the part of the defendant, under and pursuant to the 67th rule of the Supreme Court of the United States, as amended, before John A. Shields, Esq., a standing examiner of said court.

NEW YORK, *May* 17, 1886.

Present: Wm. H. L. Lee, Esq., of counsel for def'ts, and A. J. Todd, Esq., of counsel for complainant.

* * * * * * *

44 Counsel for defendants offers in evidence a copy of U. S. letters patent No. 49334, granted to William Wright for improvement in portable steam-engines and dated August 8, 1865, and the same is marked "Defendants' Exh. Wright 1865 Patent, May 17, 1886."

J. A. S., *Ex'r.*

* * * * * * *

Counsel for defendants offers in evidence a copy of U. S. letters patent No. 133,741, granted to George H. Babcock for improvement

in steam-engine and dated December 10, 1872, and the same is marked "Defendants' Exhibit Babcock Patent, May 17, 1886."

J. A. S., *Ex'r.*

Counsel for defendants offers in evidence a copy of U. S. letters patent for design No. 5305, granted to Albert A. Wilson, assignor to himself and the Yale iron works, for design for upright
45 steam-engines and dated October 3, 1871, and the same is marked "Defendants' Exhibit Wilson Patent, May 17, 1886."

J. A. S., *Ex'r.*

Counsel for defendants offers in evidence a copy of U. S. letters patent No. 123,635, granted to James R. Maxwell and Ezra Cope for improvement in steam-engines and dated February 13, 1872, and the same is marked "Defendants' Exhibit Maxwell and Cope Patent, May 17, 1886."

J. A. S., *Ex'r.*

* * * * * * *

Counsel for defendants offers in evidence a copy of U. S. letters patent No. 124,801, granted to Chilion M. Farrar for improvement in steam-engines and dated March 19, 1872, and the same is marked "Defendants' Exhibit Farrar Patent, May 17, 1886."

J. A. S., *Ex'r.*

* * * * * * *

46 Counsel for defendants offers in evidence a copy of U. S. letters patent No. 133,305, granted to Edward H. Cutler for improvement in steam-engine, dated November 26, 1872, and the same is marked "Defendants' Exhibit Cutler Patent, May 17, 1886."

J. A. S., *Ex'r.*

47 A. J. Todd, Esq., complainant's counsel, waives certification of all the patents introduced in evidence, and consents that the copies of the specifications and drawings stand in place of the patents.

Adjourned to Tuesday, June 15th, 1886, at 11 a. m.

NEW YORK, *June 16th*, 1886--11 a. m.

Met pursuant to adjournment.

Present: B. F. Lee, Esq., of counsel for defendant; A. J. Todd, counsel for complainant.

Counsel for defendants offers in evidence certified copy of letters patent of the United States granted Samuel Wright, December 26th, 1837, No. 540, and the same is marked Defendants' Exhibit Samuel Wright Patent, June 15, 1886.

J. A. S., *Ex'r.*

Also certified copy of letters patent of the United States granted to Gelston Sanford, dated February 15th, 1859, No. 22981, and the same is marked Defendants' Exhibit Sanford Patent, June 15, 1886.

J. A. S., *Ex'r.*

It is admitted by complainant that if David G. Yuengling, Jr., were called as a witness he would testify that he is not a manufacturer of the machines complained of as embodying the structures claimed in the letters patent on which this suit is brought; that he is not a dealer in such machines; that he is engaged in business in the city of New York as a brewer, and that the machines complained of are used in his business as a brewer, subject to the objection that such evidence is immaterial and irrelevant.

Adjourned to June 18, 1886, at 1.30 p. m.

48 NEW YORK, *June 18th*, 1886—1.30 p. m.

Met pursuant to adjournment.

Present: Counsel as before.

DAVID G. YUENGLING, Jr., being called as a witness on behalf of defendants and duly sworn, deposes as follows:

Q. 1. What is your name, age, residence, and occupation?

A. David G. Yuengling, Jr.; aged 44. I reside — 150 West 59th street, New York city, and am by occupation a brewer.

Q. 2. State whether or not you are a manufacturer of or dealer in steam-engines or engine frames.

A. I am not.

Q. 3. Do you know what machine it is that this suit is about?

A. Yes; I do.

Q. 4. Where is that machine situated and what is the use that it is put to?

Objected to as immaterial.

A. It is situated in my engine-room for refrigerating purposes, and is used for refrigerating.

Q. 5. How important is the refrigerating process in brewing?

Same objection.

A. It is the most important thing we have got.

Q. 6. When was the machinery in question first put in operation in your brewery?

Same objection.

49 A. It was the season of 1883. I think it was the latter part of June.

Q. 7. How continuously has that machinery been in operation ever since?

Same objection.

A. It did all the hard work during the hot weather.

Q. 8. During what portion of the year is it necessary to operate this machinery?

Same objection.

A. About eight months in the year.

Q. 9. Does that include all except the cold months?

Same objection.

A. Yes; it is kept in operation days, nights, and Sundays.

Q. 10. You say that this machine was erected and put in operation in your brewery for refrigeration in the summer of 1883. State whether at that time you had ever heard or been informed that the complainant in this suit, William Wright, had a patent that affected the machine or was claimed to affect it.

Same objection.

A. No, never.

Q. 11. When did you first obtain information to that effect?

Same objection.

A. I think it must have been a year or a year and a half afterwards. I don't recollect exactly.

50 Q. 12. Has the machinery in your brewery, which is the subject of this controversy, ever been altered in structure since it was put in operation in the summer of 1883?

A. No, sir.

Q. 13. State whether or not your business as a brewer is an extensive one.

Objected to as immaterial.

A. Yes.

Q. 14. Is the machinery in controversy now in operation? And, if so, state whether it furnishes the means that you use to carry out the process of refrigeration.

A. Yes.

Q. 15. Will you please explain a little in detail this process of refrigeration so far as it is applicable to brewing?

Same objection.

A. In producing lager beer we have got to have a cold temperature for fermentation and for storage. The nature of the article is such that it is necessary to have a cold apartment in order to produce the article. The process of cold fermentation requires cooling of the beer for about three weeks; the storage requires continuous cold. We carry on the process of manufacture continuously.

Q. 16. State whether or not at the time you purchased this machine you had any intent or design to use any structure covered by letters patent owned by the complainant or any other person or any knowledge of the existence of any outstanding patent claim against the structure that was put up in your brewery, being the machinery in question.

Same objection.

A. No.

* * * * * * *

51 Cross-examined by Mr. TODD:

X Q. 20. State whether there were at the time you ordered this machinery other ways of obtaining a cooling and storage-room temperature. If so, mention at least one of them.

A. We cooled by ice—storing ice above the cooling and storage rooms. There are also other ways.

* * * * * * *

52 DAVID G. YUENGLING, JR.

Sworn before me—

JOHN A. SHIELDS, *Examiner.*

* * * * * * *

53 U. S. Circuit Court, Southern District of New York.

WILLIAM WRIGHT, Complainant,
vs.
DAVID G. YUENGLING, JR., Defendant. } In Equity.

WILLIAM WRIGHT, Complainant,
vs.
JOHNSTON BEGGS, Impleaded, &c., Defendant. } In Equity.

Lucius P. Nolan, notary public, special examiner.

Depositions of witnesses taken for final hearing on the part of the defendants, in pursuance of the rules and practices of this court, before Lucius P. Nolan, notary public, as special examiner, by consent, at St. Louis, Missouri.

OCTOBER 21ST, 1886.

Present: B. F. Lee, Esq., for defendants, and A. J. Todd, Esq., for complainant.

Adjourned to October 22d, 1886, at ten o'clock a. m., on account of the absence of witnesses.

54 ST. LOUIS, Mo., *Oct. 22d*, 1886.

Present: B. F. Lee, Esq., for defendants, and A. J. Todd, Esq., for complainant.

JOHNSTON BEGGS, witness on behalf of the defendants, being duly sworn, deposes and says as follows:

Q. 1. What is your name, age, residence, and occupation?

A. Johnston Beggs is my name; I am 49 years of age; residence, St. Louis, Mo.; manufacturer. I am president of the Smith, Beggs & Ranken Machine Company.

Q. 2. When was that corporation organized, and did it formerly have another name?

A. I have an exemplified copy of the certificate of corporation, which I will put in evidence when required. The company was originally organized in 1874 under the name of the Smith, Beggs &

Co. Machine Works, and the present name was adopted in 1879, as will more fully appear by the certificate.

The certificate referred to by the witness is offered in evidence and marked "Exhibit Certificate of Incorporation."

It is agreed that this exhibit may be retained by defendants' counsel and not be annexed to deposition.

Q. 3. How long have you been president of said corporation?

A. I have been president since 1874, from the very beginning of the corporation.

Q. 4. Are you familiar with the engine and refrigerating
55 machine at Yuengling's brewery, in New York, which is complained of as an infringement in a suit brought against him and above entitled?

A. Yes, sir; it was manufactured by our company.

Q. 5. When did your corporation first begin to manufacture machines having frames or bed plates of the construction shown in Yuengling's machine? And state whether you or any copartnership with which you have ever been connected ever manufactured any frames for horizontal engines of the construction shown in said Yuengling's machine.

A. We first manufactured that in 1876. To the second branch of the question I answer, No, sir. I have not been in any firm or copartnership or by myself since 1874. I have been president of the corporation above referred to ever since its organization.

Q. 6. Have you ever individually made or used or sold any steam-engine frames constructed like the frames in Yuengling's brewery that have been above referred to?

A. No, sir.

Q. 7. Has any copartnership firm of which you have been a member ever made or used or sold any steam-engine frames constructed like the frames in Yuengling's brewery that have been above referred to?

A. No, sir.

Q. 8. By what name is the engine like that in Yuengling's brewery usually called by those connected with your company?

A. The Centennial engine, because it was first built in the centennial year.

* * * * * * *

56 Cross-examination by A. J. TODD, Esq, counsel for complainant:

X Q. 27. Were the incorporators the same at the time the change was made to the Smith, Beggs & Ranken Machine Company as at time of formation of the company, in 1874?

Objected to as irrelevant and as calling for a matter of record.

57 A. No, sir.

X Q. 28. Who were they at the time of the change of the corporate name, in 1879—that is, the directors?

Same objection.

A. When we first organized, in 1874, the directors were A. W. Smith, Johnson Beggs, and John Simmonds. Mr. Simmonds sold out on 1st of October, 1875, to Mr. John D. Ranken, and Mr. Ranken has been a director from that day to this.

X Q. 29. Were the old board of directors, also the board of directors under the changed name of the corporation, the only stockholders in the corporation?

Same objection.

A. We had two other stockholders from the beginning, who have been in ever since. One of them is our cashier and one of them is my brother. We gave them stock for their services, and they also put in money. I think my brother has about fifteen thousand dollars of stock (150 shares), and the cashier five thousand dollars of stock (50 shares), the whole capital stock being one hundred thousand dollars (1,000 shares). By way of further explanation I would say that my brother never was given any stock by us for services, but bought his stock, and the cashier's stock was composed of money invested by him and part stock by way of gift for faithful service.

X Q. 30. When you came on to New York to negotiate relative to a settlement and terms were offered did you not yourself personally consider them satisfactory, but state to Mr. Wright's
58 brother and myself that you would go home and consult your partner Smith, who was home sick abed, and that you would notify us as to his views respecting an acceptance of such terms?

Objected to as irrelevant and incompetent.

A. When I was ordered to New York by my company they stipulated how much they were willing to pay to avoid the expense and trouble of a lawsuit. I offered this amount of money to Messrs. Wright and Todd, and they would not accept it, and I had no authority to settle on any other basis. I went home and called a meeting of the board of directors, and they decided not to accede to their demands, and we wrote them to that effect.

Answer objected to as not responsive and evasive, and question repeated.

X Q. 31. Question 30 repeated.

Same objection.

A. I had no authority to say anything was satisfactory. I have always been willing all my life to do anything honorable to avoid a lawsuit, but I had no authority to give them any more money than our company had stipulated at the outset.

Same objections repeated as to answer, and question repeated.

X Q. 32. Question 30 repeated.

A. They agreed to take fifteen hundred dollars in full on finding out what this suit would cost. I found that it would cost nearly

that much or within two hundred dollars of it, so I thought it was better to pay that and stop all bother and trouble of
59 a lawsuit. I never thought that their claim was just, and I do not think so now. I went home and saw Smith and Ranken, and they objected to paying that amount. I said what was stated in the latter half of question 30, except that I did not call Smith my partner.

The witness' statement as to what he *he* thinks of the suit objected to as volunteer and improper.

Recess for one hour.

Since the recess I was thinking over the question above asked by counsel, and I may have said in talking with Mr. Todd and Mr. Wright that I would see my partner Smith or Ranken, for the reason that Mr. Smith and I were partners for five or six years when we first started into business; then we took Mr. Simmonds into partnership with us, and in talking now we do not call one another president, vice-president, or secretary, but we generally call one another our partners. We have not been partners since our active incorporation, in the year 1874. I do not say that I did not call Mr. Smith my partner, nor do I say that I did, but Mr. Smith was our vice-president from the start, and I have been the president until now.

X Q. 33. Is it not the fact that you hold out yourselves to be a firm or copartnership both in treating with parties who desire to purchase of you, also in advertisements, and in descriptions on your engines, that you are a firm or copartnership?

A. No, sir. When the company was first organized, in 1874, all our checks were signed Smith, Beggs and Company. Then the law of the State was changed, and you had to designate the business you were in or put the word limited. Then we signed our checks
60 Smith, Beggs & Ranken Machine Company, by John D. Ranken as secretary, and in his absence by myself as president. I do not remember that we changed any of our circulars to that effect, but in signing all contracts they were signed as secretary or president.

X Q. 34. Since you deny what is stated in the previous question, please look at the cut and description here presented to you and explain why that cut, which purports to have been engraved in St. Louis, contains your description as a firm, such cut purporting to represent the "Centennial engine," which was an engine of the year 1876, subsequent to the incorporation.

Objected to as incompetent and irrelevant and assuming what is not true.

Witness is here shown what is marked as Complainant's Exhibit Newspaper Cut "D," purporting to be a cut from the St. Louis Gazette; date of paper, Thursday, Oct. 4th, 1877.

Objection is made to the statement as to the purport of the exhibit.

A. 34. As I stated before, we were originally incorporated as Smith, Beggs and Company and signed our checks in that manner. Afterwards the legislature changed the law, and we either had to put the word limited or designate the business we were in, as, for instance, the machine business.

X Q. 35. When you were first incorporated I see by the certificate of incorporation of May, 1874, you had the words added to your firm name "machine works." How, then, do I understand by your last answer that you were ever incorporated as "Smith, Beggs and Company"? I refer you to certificate of incorporation here in evidence. Do you wish to correct your last answer?

Same objection as last noted.

61 A. 35. We were incorporated as Smith, Beggs and Company Machine Works, but all contracts and all checks were signed Smith, Beggs and Company, as was the usual custom at that time and under the advice of our lawyer, Col. Kellogg.

X Q. 36. Then it is not true, as stated in your 34th answer, that you were "originally incorporated as Smith, Beggs and Company"?

A. 36. We were originally incorporated as the Smith, Beggs and Company Machine Works, and when the law was changed it became the Smith, Beggs and Ranken Machine Company, but it was a company all the time from 1874 until the present time.

X Q. 37. Then your 34th answer is incorrect in stating that you were originally incorporated as Smith, Beggs and Company, does it not?

Objected to as already fully explained and apparent on the face of the certificate in evidence.

A. 37. I ought to have added the Smith, Beggs and Company Machine Works, but in signing a check or a contract at that time we did not add the words "machine works," as the law did not call for it and our lawyer said it was unnecessary.

All after "machine works" objected to as incompetent, hearsay, and not responsive.

X Q. 38. How is it, then, that as late as 1877 you are still described as Messrs. Smith, Beggs and Company in one of the St. Louis newspapers, as appears from the second column on "Exhibit D"?

Objected to as incompetent and irrelevant.

62 A. 38. From the 23d day of May, 1874, we were the Smith, Beggs and Company Machine Works until the 27th day of December, 1879, when the corporation name was changed to the Smith, Beggs and Ranken Machine Company, as this certificate in evidence certifies.

X Q. 39. You sold, did you not, prior to this change in the name of the corporation, steam-engines containing a bed like the one sold to Yuengling, Jr., here in suit, namely, as early as the year 1877? I refer you to the statement in "Exhibit D" that the first one was

sent to the Fort Scott and Gulf Railroad Company, at Kansas City, Mo.

Same objection.

A. 39. Yes, sir.

X Q. 40. Did not such first engine bed or frame have on it the name- plate, as shown in cut upon "Exhibit D," namely, "Smith, Beggs and Company, St. Louis"?

Same objection.

A. 40. I think it did.

Complainant's counsel puts in evidence the paper shown witness as Complainant's Exhibit Cut D, Oct. 22d, 1886.

* * * * * * *

63 X Q. 53. State generally what are the duties of yourself also those of Mr. Smith and Mr. Ranken, in your business of building and selling machines.

A. 53. I am the president of the company and in full charge of all the affairs of the company. Mr. Smith is vice-president and takes my place in my absence, and Mr. Ranken is secretary and treasurer. I have the specific charge of the selling of the
64 machines, and also the erection of them in their respective places where they go. Mr. Smith has the immediate charge of the work in the shops—that is, the manufacturing; and Mr. Ranken has charge of the financial affairs and the correspondence.

* * * * * * *

65 Redirect examination:

R. D. Q. 97. Referring to the engine frames which are the subject of these suits, who actually built and sold them—the corporation of which you are and have been an officer, that you have spoken of, the certificate of which is in evidence, or a copartnership firm known as Smith, Beggs & Co., assuming such firm to have been in existence when such structures were built?

Objected to as incompetent, as calling for a conclusion of law.

A. The corporation.

R. D. Q. 98. Who got the money on the sale of such structures?

Objected to as immaterial.

A. The corporation.

* * * * * * *

66 R. D. Q. 100. Have any of the machines which are the subject of this controversy ever been used by a copartnership firm of Smith, Beggs & Co., assuming such copartnership to have existed during the period of the existence of such machine?

Objected to as incompetent and as calling for a conclusion of law.

A. No, sir.

JOHNSTON BEGGS.

Subscribed and sworn to before me on the 23d day of October, 1886.

[SEAL.] LUCIUS P. NOLAN,
Notary Public and Special Examiner.

* * * * * * *

67 NEW YORK, *January 19th*, 1887—12 o'clock noon.

Met pursuant to adjournment.

Present: B. F. Lee, Esq., counsel for defendant; A. J. Todd, Esq., counsel for complainant.

Counsel for defendant offers in evidence a stipulation signed
68 by the solicitor for the respective parties, dated September 15th, 1886, and the same is here incorporated as part of the record, and is as follows:

"It is stipulated and agreed that the structures described and shown in the specifications and drawings of the following letters patent of the United States shall, for the purpose of these cases only, be regarded as forming a part of the state of the art existing at the date of the making of plaintiff's invention for which the letters patent No. 144,818, upon which this suit is brought, were granted.

"Nothing contained in this stipulation, however, shall be considered as limiting the date of the plaintiff's invention to any particular time so far as any other patented structures or any alleged case of prior use is concerned.

"The letters patent covered by this stipulation are the following:

"No. 112,151, Henry J. King and Daniel C. Mulock, February 28, 1871.

"No. 133,305, Edward H. Cutler, November 26, 1872.

"No. 123,635, James R. Maxwell and Ezra Cope, February 13, 1872.

"No. 118,463, Charles Levey, August 29, 1871.

"No. 116,454, Lucius J. Knowles, June 27, 1871.

"No. 126,834, George J. Roberts, May 14, 1872.

"No. 108,576, Philip Estes, October 25, 1870.

"No. 111,982, Joel Sharp and Joseph W. Thompson, February 21, 1871.

"No. 129,996, Lorenz Swenson, July 30, 1872.

"No. 5305 (design), Albert A. Wilson, October 3, 1871.

"No. 124,801, C. M. Farrar, March 19, 1872.

69 "No. 133,741, G. H. Babcock, December 10, 1872.

"New York, September 15, 1886.

"A. J. TODD,
"*Solicitor for Complainant.*
"TURNER, LEE & McCLURE,
"*Solicitors for Defendants.*"

It is admitted by counsel for the plaintiff that a competent witness having knowledge of the facts would, if called, testify that the machinery in the brewery of David G. Yuengling, Jr., in the city of New York, which is the subject of this litigation, has not been changed in any respect that bears upon this controversy since it was first built and set up in said brewery, and this admission is to have the same effect as if a witness had been called and testified to the fact stated.

Counsel for the defendant offers in evidence a copy of letters patent of the United States granted to John B. Root, dated August 14th, 1866, number 57190, and the same is marked "Defendants' Exhibit Root Patent."

HENRY L. BREVOORT, a witness produced on behalf of the defendant, being duly sworn, deposes and says:

Q. 1. What is your name, age, residence, and occupation?

A. My name is Henry L. Brevoort; my age is 37; I reside in the city of Brooklyn, and I am by occupation an engineer.

70 Q. 2. What experience have you had in the practice of your profession? And please state whether you have ever been called upon to testify as an expert witness in suits relating to patents.

A. When I was a boy I worked in a machine shop, and after that I owned and operated a shop of my own for some years. For the last twelve or thirteen years I have been principally engaged in examining patents and patented inventions, and have been called upon to testify as an expert witness before the circuit courts of the United States both in this and other circuits. I have been so called in many hundreds of cases. I might state that I have devoted my attention principally to steam-engineering matters. The shop that I was in first devoted its attention almost exclusively to the construction of land and marine engines, and later land engines were constructed in the shop which I owned and operated.

Q. 3. Have you examined and do you understand letters patent of the United States, granted to William Wright, number 144,818, dated November 18th, 1873, and have you also examined a certified duplicate of the model filed in the Patent Office in the matter of said letters patent, marked in this cause "Defendants' Exhibit Patent Office Model"?

A. I have very frequently read the patent referred to in the question, and I think that I understand that which is therein described and claimed. I have also examined the certified duplicate of the Patent Office model, and I understand the structure there represented.

Q. 4. Have you read the evidence in this cause and have you examined "Plaintiff's Model of Infringing Machine C" and "Defendants' Exhibit Correct Yuengling Model," and have you examined the steam-engine and refrigerating machine at Yuengling's brewery, in the city of New York, which is involved in this controversy?

And please explain what said models represent or are de-
71 signed to represent, and compare said models with the machinery at said brewery.

A. I have examined the various models and structures referred to in the question. The model marked "Defendants' Exhibit Correct Yuengling Model" was made under my supervision, and is a correct representation of as much of the engine frame and steam cylinder at Yuengling's as the model purports to represent and can be seen. This I know from actual measurements. The model marked "Complainant's Exhibit Model of Infringing Structure C" is a correct representation of the engine frame at Yuengling's brewery from the forward or pillow-block end of the guides to the pillow-block end of the frame. "Complainant's Exhibit Model of Infringing Structure C" is, however, incorrect from the pillow-block end of the guides to the steam cylinder. The model shows a swell at the cylinder end of the guide which is not found in the engine frame at Yuengling's brewery. The model to which I first referred, to wit, "Defendants' Exhibit Correct Yuengling Model," is, however, right in these regards, the said model being a correct representation of all portions of the parts represented that were capable of being copied from an inspection of the parts as there to be seen at the brewery of Yuengling.

Q. 5. Compare the subject-matter of the first and third claims of Wright's patent, number 144,818, with the structures in Yuengling's brewery heretofore spoken of and that which is designed to be represented by the model "Complainant's Exhibit Model of Infringing Structure C," corrected by "Defendants' Exhibit Correct Yuengling Model."

A. The patent of Wright, to which I am referred, describes an improvement in frames for horizontal engines. I may say at the outset that it does not appear that any distinction is to be drawn between a horizontal engine, an inclined engine, and a verti-
72 cal engine. In all cases the frames must be of sufficient strength to bear the necessary strain, and as the Wright patent is not for a design, but for a mechanical structure, mere questions of shape are not, as I understand it, to be considered. If the frame of the Wright engine was bolted to a vertical wall, it would still be the same structure as it is when laid upon a horizoutal floor and bolted thereto. I do not know that this question is one of importance in this case, but I call attention to the fact so that there may be no misunderstanding as to my meaning. The Wright patent describes an engine frame consisting of the following parts, as specified in the said patent: Beginning at the steam cylinder the frame is first to consist (and by the frame I mean the single casting that composes it) of a cylinder head, marked "*a*;" a semicircular connecting piece, marked "*d*;" a guiding cylinder, marked "*b*;" a trough-like connection, marked "D;" a base, "H," and a web, "*t*." The patent says:

"The extreme rear end of the frame, and forming part of the same, is the head '*a*' of the steam cylinder 'A.' * * * A semicircular connecting piece, '*d*,' merges at one end in the guiding cyl-

inder '*b*" and at the other end in the cylinder head '*a*,' thus uniting the two. * * * This combination in a horizontal engine frame of a guiding cylinder, '*b*,' cylinder head '*a*,' and connection '*d*' constitutes an especial feature of my invention."

Further on in the patent I find it stated that the ribs "*q*" "terminate at an extension of the cylinder head '*a*.'" From the above quotations it will be evident that the cylinder head "*a*" is to form an integral part of the casting which constitutes the frame and is to be a homogeneous part thereof, the specification stating,
73 as I have above quoted, that this constitutes, in connection with other parts, an especial feature of the Wright invention.

I will next refer to the semicircular connecting piece "*d*." The patent says of this part of the frame as follows:

"A semicircular connecting piece, '*d*,' merges at one end in the guiding cylinder '*b*' and at the other end in the cylinder head '*a*,' thus uniting the two, the open top of the said connecting piece permitting ready access to be had to the stuffing box of the cylinder head.

"This combination in a horizontal engine frame of a guiding cylinder '*b*,' cylinder head '*a*,' and connections '*d*' constitutes an especial feature of my invention."

From this quotation it is clear what the semicircular connecting piece is to be. It is to be a piece which connects the steam cylinder head, cast as part of the frame, with the guides or guiding cylinder, as called and illustrated in the patent, and the connecting piece is distinguished from the guiding cylinder in that it is to be only semicircular and permit ready access to be had to the stuffing box. It is, in fact, to admit of access to the stuffing box with perfect freedom throughout a complete half circle; such access being had, not through a mere hole or opening, but through the maximum-sized opening that can be obtained by cutting away one-half of the frame at this portion, and the combination of this semicircular piece "*d*," integral at one end with the cylinder head and at the other end with the guiding cylinder, is an especial feature of the Wright invention.

I will now consider the guiding cylinder "*b*." This is described all through the Wright patent as a guiding cylinder and in no other way. It is stated in the specification that the guiding
74 cylinder has lateral openings in it, so as to permit of access being had to the cross-head; but from the specification, the drawing, and the certified model the guiding cylinder is described and shown as a mere cylinder, bored out throughout its entire internal surface. The cross head was to fit this cylinder and be guided therein, the cylinder itself constituting the guide. Beyond the guiding cylinder is a trough-like connection, the base and the pillow block. I need not describe these parts in detail. Thus the frame of an engine is composed of a cylinder head, a semicircular connecting piece, a guiding cylinder, a trough-like connection, and a base; these being names given to different portions of the same casting, the entire casting constituting one part or thing in itself, and being thus divided up by name for the ease of description which

such division of the parts gave to the solicitor who drew the patent; the metal itself being homogeneous from end to end of the single thing constituting the frame, which in this structure also includes the cylinder head as part and parcel thereof.

I will now consider the first and third claims, and will state what I understand to be the combinations therein pointed out, and I will then compare the said so-called combinations with the machinery that I saw at Yuengling's, which is also represented by the correct model and the model "C" in the manner before stated.

The first claim is for a combination, the combination being made up by the attempt to combine various portions of the structure, which structure, as I have before stated, is in itself a unit or single structure. The portions of this single piece of metal which are referred to in the first claim are:

(1.) A cylinder, "*b*," which is the guiding cylinder.

75 (2.) The cylinder head "*a*," which is the head of the steam cylinder; and

(3.) The semicircular connecting piece "*d*."

These are the three portions which are referred to in the specification as constituting the special feature of the Wright invention.

Turning now to the two models, to wit, "Defendants' Exhibit Correct Yuengling Model" and "Complainant's Exhibit Model of Infringing Structure C," I will compare them, and also the Yuengling structures, with the portions of the engine frame which are recited in the said first claim. The first portion referred to is the guiding cylinder "*b*." As I have before said, in the patent and in the certified duplicate of the model of Wright, this part is shown as a cylinder having its entire interior surface bored out so that it might guide a cross-head in the same way that a piston is guided in a cylinder. In Yuengling's structure and in the two models this is not the case. The guiding surfaces in Yuengling's structure and in the two models are an upper and a lower guide, formed of two slides or fitting strips, the surfaces of which are bored out, but no other portion of the alleged cylindrical guide in these structures is bored out. Thus the Yuengling structures have not got a guiding cylinder bored out throughout its interior, but they have merely two guides or fitting strips, one above and one below, which are bored out, and the shape of the rest of the portion of the frame which sustains the fitting strips is immaterial. It might be cylindrical or it might be square or any other shape. Thus, really, the Yuengling structures have not got the guiding cylinder which is described and illustrated in the Wright patent.

The next portion of the frame which is referred to in the

76 first claim is the cylinder head "*a*." In the Yuengling structures and in the models which illustrate them, there is no cylinder head forming a part of, cast with, and constituting a homogeneous portion of the frame. The cylinder head in the Yuengling structures is a part of the cylinder and not part of the frame—the frame of the Yuengling structures terminating in a flange adapted to be bolted to a cylinder head, and in no sense does this constitute a cylinder head. Consequently the Yuengling

structures do not contain one of the important and essential portions of the frame referred to in the first claim, to wit, a cylinder head, "*a*," and neither have the Yuengling structures any equivalent for the cylinder head forming a portion of the frame.

The other portion of the frame referred to in the claim is the semicircular connecting piece "*d*." As I have before said, this portion is to be in the shape of a semicircle, leaving an opening a full half of the guiding cylinder for access to the stuffing box. In the Yuengling structures the entire side of that part of the frame through which the cross-head operates is open, not half way around, but part way around, and this opening is oval in shape and narrower at each end than in the centre, and thus the alleged equivalent for the semicircular connecting piece must be found, if found at all, in that continuation of that part of the frame through which the cross-head operates which extends between the position of the cross-head in its rearward movement and the cylinder. This part is not a semicircular portion, and neither is it open to the extent of the guiding portion of the so-called cylinder itself. In the model "C" a swell is shown, bounded by a rib at the small end of the swell between the steam cylinder and the portion of the guides where the cross-head plays, but still, even in this model, there is no semicircular portion, but there is a part that constitutes
77 almost an entire circle, the opening thus made not "permitting ready access to be had to the stuffing box of the cylinder head," but on the other hand rendering the access most difficult, as I have myself observed.

It does not seem to me, as I understand the portions of the frame referred to in the first claim, that the Yuengling structures have any of the parts referred to in the claim as those parts are defined by the specification. It is true that the Yuengling structures have guides, and that they have a portion connecting the guides with the end of the frame, but there is no semicircular connecting piece, either as such or as a piece which at one end merges into the guiding cylinder and at the other end into the cylinder head. This latter, to wit, the merging of the semicircular connecting piece into the cylinder head, cannot well take place, and, as a matter of fact, does not take place in the Yuengling structures, where no cylinder head exists as a part of the frame.

Turning to the third claim, I find that the same portions of the frame are there referred to, but that the trough "D," the base "H," and web "*t*" are added portions of the frame—added to that which sets out to form the alleged combination of the said third claim.

It is unnecessary to repeat the reasons before given why the parts referred to in the third claim are not found in the Yuengling structures. In the Yuengling structures there is no cylinder head "*a*" nor is there any equivalent for it. There is no guiding cylinder, but only two trued-up fitting strips within a portion of the frame which bears some resemblance to a cylinder, and in the Yuengling structures there is no semicircular connecting piece "*d*," but there is a mere continuation of that part of the frame through

which the cross-head operates. The opening in the said
78 guiding portion, instead of increasing so as to form a semicircular connecting piece, as in the patent, decreases, so as to prevent, if anything, ready access to the stuffing box of the steam cylinder, and in this way preventing instead of permitting ready access to be had to the stuffing box of the steam cylinder, which is to be an especial feature of the semicircular connecting piece of the patent. The semicircular connecting piece permits of ready access to the stuffing box in a way that the comparatively small opening in the Yuengling structures cannot; therefore I am clearly of the opinion that the Yuengling structures have not got the alleged combinations of the first and third claims, because they have not:

1. Any cylinder head or equivalent therefor.

2. Because they have not got a semicircular connecting piece, and as I understand the patent it is limited to a connecting piece made in the form of a semicircle.

3. Because they have not got a guiding cylinder as such, but merely an upper and lower guide, one at the top and the other at the bottom, cast into that which in the Yuengling structures has been wrongfully called a guiding cylinder.

It is true that the surfaces of the fitting strips in the Yuengling structures are trued up by a bar such as might be used for boring a complete cylinder, and in fact are so trued up, but it is equally true that in the Yuengling structures the boring bar used does not, as a matter of fact, true up the internal surface of a cylinder, but only the surface of two fitting strips, one above and the other below the centre line of the cross-head.

Q. 6. Have you examined and do you understand the following letters patent of the United States, exhibits in this cause, granted—

79 To Samuel Wright, December 26, 1837, No. 540;

To Gelston Sanford, February 15, 1859, No. 22981;

To William Wright, August 8, 1865, No. 49334;

To John B. Root, August 14, 1866, No. 57190;

To Albert A. Wilson, October 3, 1871, design patent No. 5305;

To James B. Maxwell and Ezra Cope, February 13, 1872, No. 123,635;

To Chilion M. Farrar, March 19, 1872, No. 124,801;

To Edward H. Cutler, November 26, 1872, No. 133,305;

To George H. Babcock, December 10, 1872, No. 133,741;

and, if so, compare what is contained in said several patents with the subject-matter of said Wright patent No. 144,818, and also compare said patents with the Yuengling structures.

A. I have read the several patents referred to in the question, and I think I am acquainted with the structures which these patents show and describe. I will take them up in the order of their date and will indicate that which they show which bears upon the alleged invention of Wright.

I will speak first of the Samuel Wright patent of 1837. This patent shows a locomotive, the cross-head of which is guided within a guiding cylinder, which is a true and complete cylinder, as in the

case of the Wright patent in controversy and the certified duplicate of the model. In the old locomotive this cylinder is bored true, and the cylinder, besides guiding the cross-head, also serves the purpose of a pump. All that this patent shows in this connection is that a cylindrical guide was old, and by a cylindrical guide I
80 mean a guide which is formed from a complete cylinder, like the guides of the Wright patent in controversy, and not a so-called cylindrical guide, such as is found in the Yuengling structures.

The patent of Gelston Sanford of 1859 shows a vertical steam-engine in which there is a cylindrical guide cast solid with the steam cylinder, and the patent says as follows:

"I bore out the elongated part on a line corresponding to the sides of the cylinder, which gives a true line for the cross-head "E" to work in." * * *

I will quote from another part of the patent:

"I make all the connections in the ordinary way. The great advantages of this mode of construction are in the use of a cylindrical form of the cross-head "E" working in a cylinder, making the whole more simple and cheaper and less liable to get out of order." * * *

This patent, like the last one, shows that it was old to attain true alignment of the steam cylinder and cross-head guide by boring with the same bar. Of course, in this patent there is a connecting piece between that portion of the frame in which the cross-head works and the cylinder; and if the Wright patent is broadly for any connecting part or portion, however shaped, then there is such a connecting portion in the Sanford patent. I might remark before I leave this patent that the draughtsman has made an error in the location of the steam piston or of the crank. The piston ought to be at the top of the stroke if the crank is not altered, or if the piston is not altered the crank should be at the bottom of the stroke.

I will next refer to the patent of William Wright taken
81 out in the year 1865. This patent shows a horizontal engine bolted to a boiler. The frame is constructed as follows, and I quote from the specification of the patent:

"That the head of the cylinder '*a*' is cast in one piece with the bed-plate or frame 'F,' which is a shell of a semi-cylindrical form, so as to partially enclose the moving parts of the engine."

Thus this frame has the cylinder head "*a*" of the Wright patent in controversy. It has a semicircular connecting piece which is exactly like the semicircular connecting piece "*d*" of the Wright patent in controversy, and this connecting piece gives access to the stuffing box of the steam cylinder, and at one end merges into the cylinder head and at the other end into that part or portion of the frame which constitutes the guides. It is true that in the Wright patent of 1865 the guides are not trued up with a boring bar, but are trued up in some other way. Now, this patent shows, when taken in connection with the two previous patents, that it was well known to any mechanic how the guiding surfaces could be trued

up either by a boring bar, by a planer, or any other well-known and desired fashion. Consequently, in the Wright patent of 1865, though guides are shown which are not trued up by a boring bar, any mechanic knew, or rather would have known, in the year 1865, that such guides could have been trued up by a boring bar, if such had been desired in constructing the engine, as well as by a planer or by hand work; and consequently, although the Wright patent of 1865 shows guides which are differently trued up from the Wright patent in controversy, the two kinds of guides were well-known substitutes for each other, and an engine containing one form is not substantially different from an engine containing the other form, beyond the mere fact of the
82 employment of different old methods to accomplish the same result. As a matter of fact to-day, I do not think it would be wrong to state that over 90 per cent. of the engines now in motion have guides trued up as would have been the guides of the Wright 1865 patent, and not guides trued up by a boring bar as in the Wright patent in suit or the old patents of 1837 and 1859 which I have referred to. Consequently the semicircular connecting piece of the Wright 1865 patent, although it does not merge into a cylindrical guide, merges into its then well-known mechanical substitute. Beyond the guiding portion of the frame of the Wright 1865 patent, the said frame is formed into a cylindrical, trough-like shape and terminates in an enlargement for the shaft bearing. The old 1865 Wright engine, therefore, has the cylinder head, the semicircular connecting piece, guides which were well-known mechanical substitutes of the guides of the Wright patent in suit, and a trough-like termination of the frame extending to the pillow block.

The Root patent of 1866 also shows a cylindrical guide which can be trued up with the same bar as can the cylinder, the patent stating that it is bored out and is concentric with the cylinder. This patent does not need further comment, merely showing that cylindrical guides were a very old and well-known device.

I will refer next to the patent of Albert A. Wilson, being design patent No. 5305 for the year 1871. The drawing of this patent shows an upright engine frame. The patent does not state how the guides are trued up, but, from the class of engine to which it belongs, I should judge that the guides were trued up by a boring bar in the then well-known way. This patent shows a double trough-like connection between the guides and the base, and a semicircular connecting piece which connects the guiding
83 portion of the frame with the upper part thereof. Whether this semicircular connecting portion merges into the cylinder head, as in the case of the Wright patent, or terminates merely in a flange to which the cylinder is bolted, as in the case of the Yuengling structures, I cannot tell from the patent. But however this may be, if the Yuengling structures have the semicircular connecting portion "*d*," then the Wilson frame has it also.

The next patent to which I shall refer is that granted to James R. Maxwell and Ezra Cope in the year 1872. This patent shows a

back-acting engine—that is, two connecting rods extend backward and past the cylinder and make connection with the cranks at the rear of the cylinder. The patent says as follows in regard to the cross-head guides:

"The cross-head is turned off to conform to the guideways which are fitted for the cross-head by boring at one setting to bore the steam cylinder."

Thus it is clear that the guides which are here shown as upper and lower slides, or fitting strips, are bored out truly with the steam cylinder. It does not appear how the cylinder head is inserted, whether it is cast as a part of the frame or as part of the cylinder; but, whichever way it is cast, there are connecting pieces connecting the guides with the cylinder, which are the equivalents of the part "*d*" of the Wright patent, if that part is understood as covering any and all forms of connecting portions between the guiding portion of the frame within which the cross-head works and the cylinder or the cylinder head. The frame of the engine is carried back of the cylinder and there terminates in the bearings for the shaft and in a base or pedestal. The frame toward the end assumes a trough-like form. This Maxwell and Cope engine
84 shows a cylinder, the equivalent of the connecting piece "*d*," if such piece can be said to include the part in the Yuengling structures that is said to be its equivalent. The Maxwell and Cope engine also shows guides for the cross-head trued out at one setting with the cylinder by a boring bar, the said guides being clearly the equivalent of the guiding cylinder of the Wright patent, if such part of the Wright patent can be said to cover the guiding arrangements of the Yuengling engines. The Maxwell and Cope engine also shows a trough-like connection and a rib running along the entire frame.

The next patent to which I will refer is that of Farrar, dated March 19th, 1872. This patent shows a frame for a horizontal steam-engine, having at one end the cylinder head cast with the frame, a connecting piece connecting this cylinder head with the guiding portion, a trough-like frame running from the guiding portion to a base or pedestal, and having the appropriate bearings for the shaft; and also the frame has a rib which is in substance the rib "*t*" of the Wright patent, running from one end of the frame to the other. This patent of Farrar has all of the features of the three claims of the Wright patent in suit, with the exception of one difference, if it may be so called, and that is this: Instead of having guides trued up by a boring bar in the old and well-known way, it has flat guides, which are known as a mechanical substitute (and have been known ever since the first days of steam engineering) for a cylindrical guide, or a guide trued up with a boring bar. I have known of the existence of guides like Farrar's for over twenty years. In my judgment there is no invention in substituting for the flat guides of Farrar the guides of S. Wright and of Sanford, in which event the Wright structure and the Farrar structure would be substantially identical. It is true there is a difference in shape
85 in the frame, but this, as I have before said, is not a suit on

a design patent for shape or configuration, but is a suit for an engine frame cast in one piece and having certain portions or parts so called. It is true that Farrar's frame is adapted for a double crank, while Wright's frame is adapted for a single crank, but I do not find that this is referred to as an especial feature of the invention, and indeed I suppose that if the frame of the Wright engine was provided with a bearing on the other side of the trough it would be no less the Wright frame, for it is not a question involving novelty to cut away one side of the Farrar frame if a single crank is to be used.

The patent of Cutler, of 1872, shows the well-known method of making guides above and below the cross-head in V shape, the guides being planed up and then set true with the cylinder. This patent is introduced as an excellent example of the old-fashioned V-shape guide, with some improvements in its supports.

The G. H. Babcock patent of December 10th, 1872, shows a vertical engine having a cylinder mounted at the upper part of the frame. The frame is provided with connecting pieces, connecting the cylinder or cylinder head with the guiding portion, which is practically part of a cylinder (if Yuengling's structures can be said to contain a cylinder), having fitting strips apparently bored out to guide the cross-head and two trough-like connections running to the base of the frame.

Adjourned to January 20th, 1887.

NEW YORK, *January 20th*, 1887—12 o'clock noon.

Present: Counsel as before.

It is unnecessary to go into the consideration of the first
86 and third claims, though all the features referred to in them are shown by the earlier patents.

As to the second claim, the Yuengling structures do not contain the combinations of the said claim, for, as I understand the patent, the cylindrical cross-head guide is to be one which is bored out throughout its entire interior, as would be a steam cylinder. The patent says:

"* * * And the portion of the frame which in ordinary engines is devoted to the usual flat slides consists of a hollow cylinder, '*b*,' arranged concentrically with the steam cylinder and serving as a guide for the cross-head, the guiding cylinder being simply bored out to receive a cross-head adapted to it in a manner which need not here be explained."

Further on in the patent I find the following language:

"The cylinder '*b*' not only forms the main body of this portion of the frame, but serves at the same time as a cross-head guide, which can be readily prepared for service by the same bar which is used for boring out the cylinder."

From these quotations it would seem that the guiding cylinder referred to by Wright was to resemble that of the 1837, S. Wright, patent or the 1859, Sanford, patent, in which the interior surface of cylinders themselves are used as guides, and such a construction is

clearly shown in the certified duplicate model, as well as in the drawing of Wright's patent No. 144,818. What Wright seems to have done in the patent in suit was to combine the S. Wright or the Sanford cylindrical guides with the frame of Farrar, substituting one well-known form of guide for another equally well-known form of guide. It is true that there is a change of shape
87 when the Wright patent in suit is compared with the Farrar patent, but such change in shape is not a matter of invention, but is a matter depending merely upon the designer's wishes and having relation rather to the beauty of the structure produced than to any mechanical effect which he desired to produce. One form might be lighter and more graceful than another form, but, so long as sufficient strength was present, the mechanical effect of one form and another form, so far as the shape of the trough-like portion goes, is the same, and consequently, as I regard the matter, first of all, the Yuengling structures have not got the so-called combination of parts referred to in the second claim; and, secondly, the so-called combination is not one which required any invention to produce in view of the state of the art as shown in this case, for to substitute one well-known form of guide for another does not constitute invention, but is a mere matter of mechanical judgment. Both Wright and Sanford used a guiding cylinder, and Sanford cast the guiding cylinder as a part of the frame of the engine. The Yuengling structures, on the other hand, do not have a cylindrical guide in the sense of the Wright patent, but the guides of the Yuengling structures are like those of the Maxwell and Cope patent. The Maxwell and Cope structure is cut out to a greater extent on the sides than are the Yuengling structures, thus giving a somewhat easier access to the cross-head; but this is immaterial.

I might call attention to this fact, which seems of importance when comparing these structures: The specification of the Wright patent says that the guide " * * * consists of a hollow cylinder, 'b,' arranged concentrically with the steam cylinder." As the device is shown and described, the entire interior surface of the guiding cylinder is by the boring tool made concentric with the
88 cylinder, whereas in the Yuengling structures the cross-head moves back and forth upon two fitting strips precisely like those of the Maxwell and Cope patent, and these are the only parts of the structure in which the cross-head operates that are necessarily concentric with the cylinder. The other portions might be square or any shape, or in fact they might be cylindrical and eccentric in relation to the steam cylinder.

Q. 7. State whether, in view of the state of the art, it required invention to bring together the several elements that form the alleged combinations of the claims of the plaintiff's patent No. 144,818, and give your reasons for any statement you may make.

A. Referring to the first claim, the first feature of the frame there stated is the guiding cylinder "*b*." This is old in S. Wright and Sanford. The next feature is the cylinder head "*a*" and the semicircular connecting piece "*d*," in one casting. These two elements are both found in the Farrar structure. Going to the second

claim, the guiding cylinder "*b*" is found in the patents I have above stated. The trough-like connection is found in the Farrar patent, and so is the base "H;" and in this connection I might call attention to the fact that the Farrar bed-plate is supported at its end and its center by bases, and so is the Wright, and Farrar also has a support at the cylinder end of the frame, which Wright has not.

Turning to the third claim, the cylinder head cast with the frame is shown in the patent of Farrar. The guiding cylinder is shown in Sanford and S. Wright. The same circular connecting piece is shown in Farrar where it is cast with the cylinder head. A trough-like frame is also shown in Farrar, with a base and with a web at the bottom of the trough.

89 Not considering the exact shape of the Wright structure, all the elements are old mechanically, and to select from the art the old features and put them together in one casting merely required judgment and taste to make a sightly frame, but to do this did not require any invention from a mechanical standpoint, any more than it would require invention from the same standpoint to bring together old colors and patterns in a carpet. Such a union, to be pleasing to the eye, would require taste and judgment, but not invention. So also in the matter of strength. Farrar had already made an arch-like or trough-shaped frame which was sufficiently strong; in fact, it would be stronger than the Wright frame, and he had strengthened this frame with a strengthening rib, running its entire length, as in the Wright structure, and with this frame he had combined the cylinder head "*a*," just as Wright has claimed in the first and third claims. Now, to add to this structure the S. Wright or Sanford guide as the substitute for the flat slides, as the Wright of the present controversy has, or to substitute the Maxwell and Cope guides, as has been done by the builders of the Yuengling structures, merely required a selection from the art of the most available, or rather the desired, features (I cannot say the best, as it is not the general practice to use bored-out cross-head guides in steam-engines.)

Q. 8. State how, if at all, these several parts that are stated as elements of the several claims of Wright's patent No. 144,818 co-operate to produe a result.

A. They do not co-operate to produce a result except in the sense that they exist in one casting. Each part of the entire structure performs its own function without in any manner modifying the action of any of the other parts, and each part would perform the same function independent of the other parts if it was aggre-

90 gated with a set of entirely different parts. For example, the guiding cylinder "*b*" would operate precisely in the same way were it aggregated with a connecting piece that was not semi-circular. In the second claim the base "H" would operate to support the frame in the same way, whether the frame was a trough-like frame or any other form of frame or whether a guiding cylinder was used or flat guides were used. The web "*t*" would operate to strengthen the frame in the same way, whether the frame was one shape or another shape or whether the cylinder head "*a*" was

cast with it or whether it was cast separately from it. I might multiply the illustrations by taking up each of the so-called elements of each of the claims separately, but it is unnecessary.

Q. 9. Compare the "Complainant's Exhibit Wright Model 'B'" with "Defendants' Exhibit Patent Office Model" and the specification and drawing of the Wright patent No. 144,818.

A. I have made the comparison. "Complainant's Exhibit Wright Model 'B'" does not agree with the patent and with the certified duplicate model in two important respects and in three or four details. The model "B" has upper and lower cross-head slides, these being the only parts of the so-called guiding cylinder that could be bored out and utilized for the slides, thus leaving guiding surfaces which are like those of Maxwell and Cope and unlike those of the Wright patent No. 144,818. Further, the Wright model "B" is so imperfectly made as to leave room for supposition that the frame is bolted to the cylinder head instead of the head being cast with the frame. I may state that some of the strengthening ribs for the bosses, the bolts, cross-head, and piston-rod are also left out; but these differences are, perhaps, of small importance. The certified duplicate model is a correct representation of what is shown and
91 described in the Wright patent, while model "Exhibit B" is defective.

Counsel for defendants offers in evidence a certified traced drawing of the letters patent granted to Gelston Sanford February 15, 1859, No. 22981, for improvement in steam-engines, and the same is marked "Defendants' Exhibit Sanford Traced Drawing."

Q. 10. Please examine "Defendants' Exhibit Sanford Traced Drawing" in connection with the Sanford patent of which you have spoken, and explain such drawing, if you deem any explanation necessary.

A. The drawing referred to in the question illustrates on a larger scale that which is shown in the Sanford patent. I have already pointed out the defects—that the drawing is not an artistic one, and that several draughtsmen's errors exist in it. These I find also existing in the tracing, but they are of such a nature that any one accustomed to steam-engineering would be able to construct the apparatus in a proper and workmanlike manner from these drawings and would not be deceived by the errors.

Q. 11. The specification of the plaintiff's patent, No. 144,818, states as follows:

"The cylinder '*b*' not only forms the main body of this portion of the frame, but serves at the same time as a cross-head guide, which can be readily prepared for service by the same bar which is used for boring out the cylinder."

Compare the Yuengling structures with what is described in the patent in the respects just mentioned.

92 A. As to the boring out with the same bar I have already considered this point and need not state anything further in regard to it. As to the cylinder "*b*" forming the main body of this

portion of the frame it very clearly does so in the plaintiff's structure, as will be more plainly seen by an examination of the drawing and model. In the Yuengling structures, on the other hand, what has been called the equivalent of the cylinder by plaintiff's witness Wright is cut away on one side so as to lose its strength as a cylinder, and the strength of the frame at this portion has been made up by a large and heavy foot or base, which extends almost the entire length of the part said to be the equivalent of the guiding cylinder of Wright. In this way the strength of the frame at the guiding portion lies rather in the foot or base than in the portion above it, and it cannot be correctly said that the part containing the guiding surfaces "forms the main body of this portion of the frame." These considerations further confirm my view that the Yuengling structures do not contain the so-called combination of the second claim of the plaintiff's patent.

No cross-examination.

HENRY L. BREVOORT.

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93 *Testimony for Complainant in Rebuttal.*

NEW YORK, *April* 11, '87—10.30 a. m.

Met pursuant to adjournment.

Present: Mr. A. J. Todd, for complainant, and Mr. B. F. Lee, for defendant.

Examination of Henry B. Renwick.

Q. 1. What is your name, age, residence, and profession?

A. Henry B. Renwick; aged 69. I reside at 29 Park avenue N. Y. city, and am by profession a civil and mechanical engineer.

Q. 2. Are you familiar with the construction and operation of steam-engines? And state whether you have testified in suits relating to the same.

94 A. I have been familiar with their construction and operation for 50 years or more, and have been engaged as expert in many suits relating to steam-engines, commencing 30 or 35 years ago, and while principal examiner in the Patent Office I had charge of the class of steam-engines.

Q. 3. Have you examined the letters patent granted to Wm. Wright, the complainant, on the 18th day of November, 1873, numbered 144,818, and marked Exhibit A in this suit, and do you understand the inventions therein described and claimed?

A. I have frequently examined the letters patent named in the question, and believe I understand the invention therein described and claimed.

Q. 4. Describe the parts which constitute the engine frame referred to in the specifications and drawing of said Wright patent No. 144,818.

A. The duplicate Patent Office model, Exhibit Patent Office

Model, and Complainant's Exhibit Wright Model B, are both fair representations of the engine frame as a whole described in the patent. The engine frame as a whole is to the eye of an engineer evidently a frame designed for a horizontal single-crank engine and not for an upright or an inclined engine, the fact that it is designed for a single-crank engine being clear, not only because the frame is provided with only one pillar block, but because the other side of the frame has no pillar block nor such a form as would support a second pillar block. The patent distinctly states that that side of the frame which carries the pillar block "is continued in a plane coinciding with the centre of the cylinder *b* from the latter to the enlargement *n* for receiving the bearing of the crank shaft," while in reference to the other side of the frame it states that "the opposite side *p* of the trough extending from the guiding cylinder *b* with
95 a gradually descending curve to the base H, into which it merges." Further, the horizontal rib on that side of the frame on which the pillar block is secured is carried from the pillar block rearwards alongside of the guiding cylinder *b* and until it reaches the steam-cylinder head, while the curved horizontal flange on the other side of the frame is only carried back to the guiding cylinder, thus proving clearly that it was intended to take the greater part of the strain, as must necessarily be the case on that side of the frame which carries the single pillar block for the single crank of Wright's engine. Further, a measurement of the drawing shows that the horizontal flange on the side of the engine which carries the pillar block is wider and therefore stronger than the horizontal curved flange on the other side of the engine, which is the proper construction where only a single crank and pillar block are employed.

The large foot or base H, moreover, shows clearly that the frame is adapted for a horizontal engine only. The patent is not for a design, although it might have been, for patents have been granted, to my knowledge, for useful, not ornamental, designs, and the design has to an engineer that beauty which arises from the shape and combination of the parts, being such that they are perfectly fitted for the accomplishment of the desired result. The parts which constitute the engine frame, beginning at the crank shaft end, are, first, the base H, which is a sort of oval ring, with a wide bearing surface, which is attached to the front end of the trough and with its centre lying under the crank end of the connecting rod.

The second part is what the patent calls "the inclined concavo-convex trough D, deep enough to permit the free movement of the connecting rod." It is further stated that this trough is provided with the strengthening ribs or flanges I have spoken of, one
96 of which extends in a straight line from the steam-cylinder head to the pillar block and the other of which curves downward as it goes forward and is continued along the upper edge of the base H. The third part of the frame is what the patent calls the guiding cylinder *b*, the axial line of which is the same as that of the steam cylinder. The trough is attached to the front part of

this cylinder, and it is stated that this cylinder serves as a cross-head guide, "which can be readily prepared for service by the same bar which is used for boring out the cylinder," thus doing away with costly fittings, etc. It is not stated in the patent whether this cylinder is to be bored out through its whole circumference in order to act as a guide for the cross-head or bored out through a part of its circumference, it being evident to an engineer that it must be bored out through sufficient arcs of its circumference to serve as a cross-head guide. In a horizontal engine the strains of the cross-head against the guides are in vertical planes, or nearly so, and are none of them in horizontal planes. It is clear, therefore, that if the guiding cylinder be only partially bored out that the arcs thus bored should be at the top and bottom of the cylinder. It is stated in the specification that lateral openings are to be made in this guiding cylinder in order that free access may be had to the cross-head.

Fourth. Proceeding rearward, we come to what the patent calls the "semicircular connecting piece *d*." One end of this connecting piece merges into the rear end of the guiding cylinder *b* and the other end into the circumference of the steam-cylinder head, and it is stated that the open top of said connecting piece permits "ready access to be had to the stuffing box of the cylinder head." If this access to the stuffing box were unnecessary this piece *d* might be a complete cylinder or a conical frustrum. The cylinder head, in the
97 description of the patent, is also described, "fifth, as forming a part of the frame," and this cylinder head lies at the rear end of the connecting piece *d*. A long vertical rib, marked *t* in the drawing, extends from the rear end of the base H under the trough D, the guiding cylinder *b* and the connecting piece *d* thus strengthening the whole frame to resist strains in vertical plane. The only use that I can see in casting the guiding piece *b* as a cylinder instead of a trough is to provide the necessary upper bearing for the cross-head and in such location that it can be bored out and trued by the same bar by which the steam cylinder is bored out.

Q. 5. Have you examined the patents put in evidence on the part of the defense and referred to by defendant's expert in answer to the 6th question? If so, will you please compare the same with the constructions covered and claimed by the said Wright letters patent No. 144,818, Exhibit A, here in suit, and state whether or not the constructions described in any of the said patents show or contain the features claimed in any one of the claims of said Wright patent, and give any reasons you may have for your conclusions? The patents so put in suit and to which your attention is directed are as follows: To Samuel Wright, December 26, 1837, No. 540; Gelston Sanford, February 15, 1859, No. 22981; William Wright, August 8, 1865, No. 49334; John B. Root, August 14, 1866, No. 57190; Albert A. Wilson, October 3, 1871, design patent No. 5305; James B. Maxwell and Ezra Cope, February 13, 1872, No. 123,635; Chilion M. Farrar, March 19, 1872, No. 124,801; Edward H. Cutler, November 26, 1872, No. 133,305; George H. Babcock, December 10, 1872, No. 133,741.

A. I have examined all the patents enumerated in the question

and compared them with the inventions described and r
98 ferred to in the claims of the Wright patent in suit and fin
that none of these prior patents describe Wright's frame as a whole or the combinations of elements thereof which are claimed in the three claims of the Wright patent.

I will take up the patents seriatim.

The first is that to S. Wright, No. 540. This patent describes an old-fashioned locomotive engine, in which the supply or feed-pump cylinder appears from the patent, but is not specifically described to be bolten fast to the frame of the engine with an interval between it and the steam cylinder. There is no other way of supporting the feed pump than this, so far — I can discover from the patent, and it therefore makes no part of the engine frame, but is merely bolted to the engine frame as the usual cross-head guides are. The patent does state in substance that the axial line of this feed pump is to be the same as the axial line of the steam cylinder, and that the pump piston would therefore serve as a cross-head guide for the steam-piston rod, but they would not be bored out after the two were in place, as no mechanic would think of boring them out after they had both been bolted onto the engine frame.

Moreover, there are not and cannot be any holes or apertures in this pump cylinder for getting at the cross-head; and, further, this pump cylinder must have a head and a stuffing box to it on the end nearest the steam cylinder in order to make it a pump.

I find in this patent no description of any element of the invention of the Wright patent in suit, and even if I be in error on this point as to the pump cylinder of Wright, 540, being the guiding cylinder of the Wright patent in suit, it is perfectly evident that this Wright patent 540 has not the semicircular connecting piece D of the first claim of Wright in suit, nor the base H and trough-like
connection of the second claim, nor these same parts in the
99 third claim or the web *t*, which is also a part of the third claim.

Next in order is the patent to Gelston Sanford, No. 22981. I could not understand this patent from the Patent Office copy and lithograph drawing; neither can I understand it from the large tracing drawing which is an exhibit in the case. I cannot find out how the crank shaft is to be got into place nor how that cylinder head which contains the stuffing box is to be secured in position. The frame is evidently the frame of a vertical or upright engine, not of a horizontal one, the drawings showing this; and it is manifest that the engine has not either the trough-like connection or the web *t* or the base H of the Wright patent in suit, and therefore does not exhibit the invention referred to in the second and third claims thereof.

Further, this Sanford patent does not show any semicircular connecting piece *d* or connecting piece with apertures in it, which will give access to the stuffing box; and I can find no way of getting at the stuffing box in this Sanford patent, in case it should leak or get out of order, except by taking out both cylinder heads and the steam piston; and I suppose in making this statement that the cylinder head H can be taken out, but see no way shown by the

drawing in which this can be done. The Sanford engine as described and represented is an impracticable one.

The next patent in order is that to Wm. Wright, No. 49334. This patent represents a horizontal engine, but not one like that of Wright in suit. It is not to stand on a horizontal base. On the contrary, it consists of a frame which is to be bolted to the vertical side of a boiler, and consequently must differ in many respects from the Wright engine frame in suit. This frame may be considered, as a whole, as the half of a pipe or tube, the plane which cuts the tube in two being a vertical one. This semi-tube is not 100 bored out to form guides for the cross-head; but the guides are evidently separate pieces, bolted or otherwise secured to the edges of the semi-tube. They are clearly shown in Figs. 1 and 3 as being separate from the tube, and their shape and that of the cross-head demonstrates clearly that they are not bored out, but planed. There is no trough-like connection in this patent 49334, no base, no web *t*, no guiding cylinder bored out to receive the cross-head and serve as a guide, and the only elements of the Wright patent in suit found in this claim of patent 49334 are the semicircular connecting piece *b* and the steam-cylinder head *a*. I have read Mr. Brevoort's testimony in relation to this patent, and desire to say further that the trough-like piece which carries the guide in this Wright patent 49334 is only a semi-cylinder or a little more than a semi-cylinder, and could not be bored up by a boring bar so as to serve as a guide for a cross-head. The trough-like piece must be of considerably greater arc than 180° in order to be bored by a boring bar and give sufficient support to the cross-heads.

The patent to Root, No. 57190, describes a trunk engine—that is, an engine in which the piston rod is hollow, a trunk, and the connecting rod is pivoted and swings inside of this trunk, the object being to secure a very compact engine, or, in other words, one in which the main shaft and crank are very close to the steam cylinder. Such engines, prior to Root's invention, had two stuffing boxes surrounding the piston or trunk, one at each end of the cylinder. In this patent of Root the two stuffing boxes are still there; but the packing, instead of being located in the box, and stationary, is located in the hollow piston-rod, and reciprocates. There is no cross-head, strictly speaking, in this engine, and none is needed, and the hollow piston-rod or trunk is not guided rigidly within the 101 guides F F, but is only kept in line, so far as it may be, by expanding packing rings E E. I cannot find in this patent the slightest resemblance to any element of the Wright patent in suit. It certainly has no trough, no guiding cylinder, no base, no vertical strengthening web.

The patent to A. A. Wilson, No. 5305, is a design patent for a steam-engine frame. The patent states and the drawing shows that it is an upright frame, and it would need a person very well skilled in engines or an inventor to complete the frame so as to make it useful. There is no statement in it that the guides for the cross-head are to be bored out, and, as far as I can gather from the drawing and description, they must be planed. It has nothing in com-

mon with Wright's patent, except the semicircular connecting piece *d*; and therefore does not contain the invention set forth in any of the claims of the Wright patent in suit.

The patent to Maxwell & Cope, No. 123,635, represents and describes what is commonly known as a back-action engine—that is, one in which the cross-head is in one end of the steam cylinder and the cranks are on the other end of the same cylinder. This kind of engine necessarily involves two cranks (not one only as in Wright) and two connecting rods, whereas the Wright frame is designed for an engine with one crank and one connecting rod only. This engine has a guiding cylinder somewhat like the cylinder *b* of the Wright patent, and perhaps, although I am not perfectly certain on this point, an equivalent for the semicircular connecting piece *d* of the Wright patent in suit, and the guiding cylinder can be bored out by the same boring bar which bores out the steam cylinder, but the guiding cylinder is stopped up at one end, whereas Wright's is open, so that in Maxwell, as clearly described in the patent, the cross-head must be made in two sections or pieces. Moreover,
102 such stopping up of the guiding cylinder at the end furthest from the steam cylinder would be fatal in Wright's device, because, in such a contrivance, the connecting rod of Wright could not play in the required manner.

Moreover, in the Maxwell patent there is no trough like that of Wright. There are two species of ears projecting from the end of the cylinder furthest from the stuffing box to sustain the two pillar blocks, and these ears are not in the position of Wright's trough, but on the opposite end of the steam cylinder, and therefore combined in a different way with the guiding cylinder and the connecting piece *d* of Wright, because in Wright the connecting piece, the guiding cylinder, and the trough are all on the same end of the steam cylinder, while in Maxwell and Cope the connecting piece and their guiding cylinder are at one end of their steam cylinder, and the ears which support the two pillar blocks are at the other end of the steam cylinder. It seems to me that it is very clear that this patent to Maxwell & Cope does not exhibit any of — combinations referred to in the claims of the Wright patent in suit.

The patent to Farrar, No. 12480, describes a frame for a horizontal engine. In this engine the frame is a trough-like, but not Wright's trough-like, connection, extending all the way from the steam cylinder to the pillar box. This trough-like connection is also provided with rib or web *t* of Wright, which extends underneath the trough-like connection from the steam cylinder to the end thereof; and this trough-like connection of Farrar is supported at the end furthest from the cylinder by a base or foot piece E of the Farrar drawing; but the trough-like connection of Farrar is different entirely from that of Wright in suit. Farrar's is a trough designed for supporting two pillar blocks and two cranks. Both upper edges of
103 the trough are horizontal, as they must be for an engine like Farrar's, and neither side of the trough extends, as specifically described in Wright's patent, "from the guiding cylinder with a gradually descending curve to the base into the upper portion of

which it merges." It is clear, therefore, that Farrar has not the trough of the Wright patent in suit. Further, it is clear that the Farrar patent has the ordinary planed guides for the cross-head bolted or in some other way attached to the trough, and also that the trough is such a small portion of the circumference of a whole circle that it could not be bored out to form guides for the cross-head, this latter point appearing conclusively from inspection of Fig. 5. I have said before that the cross-head must be supported by a cylindrical guide in a horizontal engine at the top and bottom. The inspection of one of the Wright prior patents and of Maxwell & Cope will show that they understood this; but in the patent to Farrar the whole of that portion of the trough to which the guides are bolted lies below a horizontal plane passing through the axis of the steam cylinder; consequently, if the trough were made a little larger and bored out (neither of which constructions are described in Farrar's patent), it would still not be Wright's guiding cylinder unless it were continued upwards, so that portions of it would lie directly above the piston-rod.

I do not find in this patent any of the elements referred to in the claims of the Wright patent in suit, except, perhaps, the connecting piece *d*, and certainly the cylinder head cast in one piece with the frame. Neither of these are claimed separately or together in the Wright patent, but only in combination with other elements. This patent to Farrar exhibits a much closer resemblance to the Wright invention than any other of the prior patents, but
104 nevertheless does not show the Wright invention or the combination of elements referred to in the claims thereof.

The patent to Cutler, No. 133,305, has no bearing whatever upon the patent of Wright in suit.

The patent to Babcock, No. 133,741, is a patent for an upright engine with what is commonly known as a "jew's-harp frame." There is no statement that the guides, which are cast in one piece with the frame, are to be or can be bored out with a boring bar; but, on the contrary, as far as I can discover from the drawing, it is clear that they are to be planed out. The patent is for a new valve motion or cut-off, and the patent is, therefore, very naturally silent on all points relating to the framing of the engine. It evidently has none of the elements of the Wright frame except the connecting piece *d* of Wright.

Q. 6. Certain other patents are introduced in evidence by the defendants, but upon which no testimony has been taken. Have you examined them and do you find there is contained in any of them the inventions claimed in the Wright patent in suit? They are as follows:

O. M. Stillman, 48321, June 20, '65.
Thos. Doane, 72820, Dec. 31, '67.
Philip Estes, 108,576, Oct. 25, '70.
Sharp & Thompson, 111,982, Feb. 21, '71.
King & Wheelock, 112,151, Feb. 28, '71.
L. J. Knowles, 116,454, June 27, '71.
Charles Levy, 118,463, Aug. 29, '71.

Geo. J. Roberts, 126,834, May 14, '72.
L. Swenson, 129,996, July 30, '72.

A. I have examined all the patents named in the question, and none of them exhibit or describe the inventions referred to in the claims of the patent in suit.

Adjourned to Tuesday, April 12th, 1887, at — a. m.

105 NEW YORK, *April* 12, 1887—10.30 a. m.

Met pursuant to adjournment.

Present: Parties as before.

Examination of HENRY B. RENWICK continued:

Q. 7. Please read Mr. Brevoort's answer to that part of the 5th direct question in which he says: "I may say at the outset that it does not appear that any distinction is to be drawn between a horizontal engine, an inclined engine, and a vertical engine," and state whether his conclusions are correct with reference to his not drawing a distinction between the horizontal and vertical engine frame.

A. I have read the part of the answer referred to in the question and do not agree with Mr. Brevoort, but, on the contrary, think that there is a great distinction to be drawn between the frames of horizontal, inclined, and vertical engines, and even between the frames of different kinds of horizontal engines. This will appear from the patents put in evidence by the defendants herein, they showing that the frames of vertical and horizontal engines are very different, and also that different frames are needed for horizontal engines bolted against a wall and those resting on a horizontal foundation, and also that frames are needed for back-action and trunk engines (both of which are horizontal engines) which differ from the frames of ordinary horizontal engines. Further, there is a difference between the frames for horizontal engines with one crank and those in which two cranks are employed. In all plans for frames one of the main points to be considered is how to shape a given weight of iron so as to make the strongest structures, having in view the various strains to which the frame is to be subjected when the engine is at work, and I include among those strains to
106 which the frame is subjected the effect of the weight of the various parts and the tendency of the various parts to get out of proper alignment, thus permitting buckling or vibration, and I may here state that I have seen many frames of engines that buckled at every stroke, including even the frames of small horizontal engines. I myself have planned engine frames and should never think of planning the same frame for use in both horizontal and vertical engines or even for use with different varieties of horizontal engines. I agree with Mr. Brevoort in his statement that mere questions of shape are not to be considered; but when a particular shape is thought out or invented for the purpose of produeing a useful effect, then such question of shape is an important one.

Q. 8. Please also refer to that portion of his 5th answer in which

be says that "from the Wright specifications and drawings of the patent in suit and the certified Patent Office model, the guiding cylinder is described and shown as a mere cylinder bored out throughout its entire internal surface," and that part of his answer in which he reiterates this statement and adds, "In Yuengling's structure and in the two models this is not the case." State whether this is a material question in this case and whether any one of the claims of the Wright patent in suit is limited by reason of anything being stated in the specifications which limits the claim to a cylinder bored out throughout its entire internal surface.

A. It is nowhere stated in the Wright specification that the guiding cylinder is to be bored out over its whole internal surface, nor are the claims limited to a cylinder thus wholly bored out so as to be smooth all over on its internal surface. The question whether the cylinder is to be bored out on its whole internal surface or only on a certain portion of that surface is an immaterial one, provided that
107 when it is only partially bored out it is bored out to a sufficient extent to prevent the cross-head cutting, and that the boring out is done in such lines of the cylinder as will properly support the cross-head against the strain to which it is subjected, and this is the way in which the guiding cylinders of the Yuengling models are bored out, namely, on the bottom and top of the guiding cylinder and to a sufficient extent to prevent the cross-head from heating or cutting.

Q. 9. Also please refer to the latter part of his same answer, in which Mr. Brevoort states that the first and third claims are not infringed because they have not got—

I. Any cylinder head or equivalent therefor.

II. Because they have not got a semicircular connecting piece, and, as I understand the patent, it is limited to a connecting piece made in the form of a semicircle.

III. They have not got a guiding cylinder as such, but merely an upper and lower guide, one at the top and the other at the bottom, cast into that which in the Yuengling structure has been wrongfully called "a guiding cylinder;" also the last paragraph commencing "it is true," &c., down to the end of the answer, and state whether any of the claims are limited to a guiding cylinder bored out in a particular way.

A. I understand from Mr. Brevoort's testimony that in the Yuengling contrivance the steam-cylinder head, instead of being separate from the cylinder, as usual, is cast in one piece with the cylinder, so that there is only one joint necessary to attach the steam cylinder to the frame instead of two, as would be the case if the cylinder and cylinder head were cast separately. The cylinder is, therefore, attached to the frame in Yuengling in an equivalent manner
108 to what it is in the Wright contrivance; and if the court shall not hold the words of the Wright specification, viz., "the extreme rear end of the frame and forming part of the same is the head" *a* of the steam cylinder A, as controlling to the extent that the cylinder head must be cast in one piece with the rest of the frame, then the defendant does not escape infringement by casting

the cylinder head in one piece with the steam cylinder and securing both by one set of bolts to the frame.

The cylinder head is really no part of the frame, but, on the contrary, a part of the cylinder.

I understand from Mr. Brevoort's statement that he thinks that the Wright patent in suit is limited to a semicircular connecting piece, "one made in the form of a semicircle."

I do not understand this statement to be correct, first, because the Wright drawing shows clearly that the connecting piece is not of that form throughout its length, but, on the contrary, is in parts more than a semicircle, as will clearly appear by reference both to the drawing and the Patent Office model; second, because this connecting piece is the same, whether it have a greater or less aperture in it, provided the aperture is sufficiently large to permit "ready access to be had to the stuffing-box;" and in the Yuengling device, as illustrated by the models in evidence, there is sufficient opening in the connecting piece to permit of ready access to the stuffing-box.

I understand further from Mr. Brevort's testimony that the guiding cylinder of the Yuengling contrivance is a cylinder in which those parts of the circumference which guide the cross-head are trued up by a bar which is used for boring a complete cylinder, and he attempts to draw a distinction between the guiding cylinder of the defendant's and the Wright cylinder, because the latter
109 is only bored out through certain arcs, while he supposes the former to be described as being bored out over its whole internal surface. As will appear from what I have before stated, I do not think this difference is a material one, and do not think that Wright's description limits the invention to a guiding cylinder, which must of necessity be bored out over its whole inner surface. The cylinder, whether fully or partly bored out, not only forms, in the words of the patent, the main body of this portion, but serves at the same time as a cross-head guide, which can be readily prepared for service by the same bar which is used for boring out the cylinder.

In my opinion defendants would infringe all the claims if the court holds that the first and third claims are not strictly and definitely limited to a steam cylinder head cast in one piece with the frame. The second claim, it is evident, does not include the cylinder head as an element thereof.

Q. 10. Mr. Brevoort states in substance in the sixth answer, with reference to the second claim, that all that Mr. Wright did "was to combine the S. Wright or the Sanford cylindrical guides with the frame of Farrar, substituting one well-known form of guide for another equally well-known form of guide," stating further that "there is a change of shape when the Wright patent in suit is compared with the Farrer patent, but such change in shape is not a matter of invention, etc.," the words change of shape, as I suppose, referring to the change of shape of Wright's trough when contrasted with Farrar. Do you agree with Mr. Brevoort that this is all that Wright did?

A. I agree with Mr. Brevoort that Wright's trough is changed in

shape when contrasted with Farrar's, but do not agree with him that that change of shape has relation rather to the beauty of the frame than to any mechanical effect which Wright desired to produce.

110 There is no particular beauty in the frame of Wright or of Farrar, artistically speaking, but there is that sort of beauty which an engineer feels when he sees a structure perfectly designed to suit its intended purpose. Farrar's frame is designed for a double-cranked engine, and a great part of his frame would be useless if the engine had only a single crank, and the weight of metal is improperly disposed to produce the best effect in resisting the strain of a single-cranked engine. Wright's frame, on the contrary, is designed for a single-cranked engine, with the greater part of the strength of the trough on the crank side thereof, he expressly stating that that side of the trough which does not carry the pillar-block extends with a gradually descending curve to the base, while the other side, which supports the pillar-block or crank-shaft bearing, is continued in a horizontal plane from the cylinder to the pillow-block. The troughs of Farrar and Wright are different substantially, and are made thus different because the designer of each was seeking to secure a different object from that sought by the other; and, even supposing that the cylindrical guides of Wright and Sandford could without invention be made part of the frame of Farrar, the result, when they were so substituted, would not be the Wright frame as a whole. Now, it will further appear that the S. Wright guide, although it acts as a guide, is in reality a pump, has no apertures in it for access to the cross-head, and does not make part of the S. Wright engine frame, but is bolted thereto, and it would require contrivance and invention, perhaps of a very small kind, to originate the idea that such a pump as that of S. Wright could even when altered into Wright's guiding cylinder and made part of an engine frame and afterwards to devise such alterations of the frame and pump as to enable them to be cast together as a complete whole.

111 Sanford's cylindrical guide, it is true, is in one piece, as I understand it, with his engine frame, but it is cast in one piece with the steam cylinder and would be impracticable for any but very small engines, even if the engines could be built from the description and drawings; and I do not think that an examination of Sandford's patent and Farrar's patent would suggest to any one the idea of Wright's frame, and it is evident that Sandford's guiding cylinder could not be put into and made part of Wright's frame unless its construction and its connection with the other parts of the engine were materially changed.

It is not a matter of much importance whether I am right or wrong in my opinions on the question of substituting S. Wright's or Sandford's guides into Farrar's frame, because even when so substituted into Farrar's place of his guide the combination referred to in the second claim of the Wright patent in suit would not be found, for the reason that Farrar has not the trough-like connection D of the Wright patent in suit.

If one side of the Farrar frame were cut away it still would not be the Wright frame, and in order to convert it into the Wright

frame it would be necessary to transfer that portion of the metal which was cut away to the side of the frame that supports the crank.

HENRY B. RENWICK.

Sworn before me—
JOHN A. SHIELDS, *Examiner.*

Cross-examination waived.

113 UNITED STATES PATENT OFFICE.

WILLIAM WRIGHT, of Newburg, New York.

Improvement in Frames for Horizontal Engines.

Specification forming part of Letters Patent No. 144,818, dated November 18, 1873; application filed July 26, 1873.

To all whom it may concern:

Be it known that I, William Wright, of Newburg, Orange county, New York, have invented an improvement in frames for horizontal engines, of which the following is a specification:

The object of my invention is the attainment of both lightness and strength in the construction of frames for horizontal engines, and at the same time to dispense with much of the fitting and other costly work demanded by the ordinary frames of engines of this class.

(Here follows diagram marked p. 112.)

These objects I attain in the manner shown by the side view, figure 1, and the plan view, Fig. 2, of the accompanying drawing. The extreme rear end of the frame, and forming part of the same, is the head *a* of the steam-cylinder A, and the portion of the frame which, in ordinary engines, is devoted to the usual flat slides, consists of a hollow cylinder, *b*, arranged concentrically with the steam-cylinder, and serving as a guide for the cross-head, the guiding-cylinder being simply bored out to receive a cross-head, adapted to it in a manner which need not here be explained, as it forms no part of my present invention. There are lateral openings *e e* in this cylindrical guiding portion of the frame, in order that access may be had to the cross-head. (See transverse section, Fig. 4, on the line 3 4.) A semicircular connecting-piece, *d*, merges at one end in the guiding-cylinder *b*, and at the other end in the cylinder-head *a*, thus uniting the two, the open top of the said connecting-piece permitting ready access to be had to the stuffing-box of the cylinder-head.

This combination, in a horizontal engine-frame, of the guiding-cylinder *b*, cylinder-head *a*, and connection *d*, constitutes an especial feature of my invention. The cylinder *b* not only forms the main body of this portion of the frame, but serves at the same time as a cross-head guide, which can be readily prepared for service by the same bar which is used for boring out the cylinder.

W. WRIGHT.

Frames for Horizontal Engines.

No. 144,818. Patented Nov. 18, 1873.

FIG. 1.

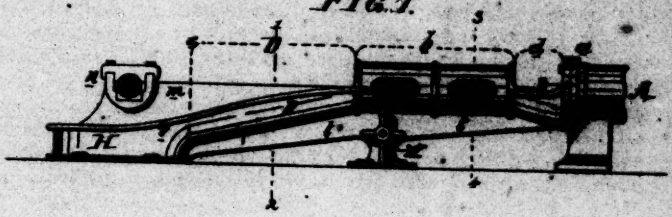


FIG. 2.

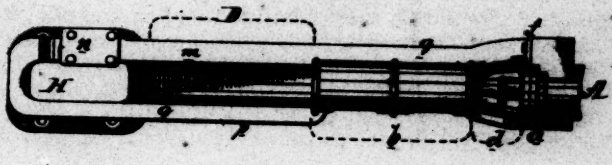


FIG. 3

FIG. 4.

Witnesses
Geo. H. Christ.
Jas. B. Ramsdell

Mr. Wright

It will be readily understood by those familiar with the costly fitting and other preparations demanded by the slides of ordinary horizontal engines that the said combination conduces to simplicity, lightness, strength, and economy in the construction of the frame.

From the front of the guiding-cylinder *b* to the point *x*, where it meets the base H, the frame is made in the form of an inclined concavo-convex trough, D, deep enough to permit the free movement of the connecting-rod, and this trough, the sectional form of which will be observed in the transverse section, Fig. 3, on the line 1 2, has one side, *m*, the upper edge of which is continued in a plane coinciding with the center of the cylinder *b*, from the latter to the enlargement *n*, for receiving the bearing of the crank-shaft, the opposite side *p* of the trough extending from the guiding-cylinder *b*, with a gradually-descending curve to the base H, into the upper portion of which it merges.

The form of the base is too clearly explained by the drawing to need description.

A strengthening-rib, *q*, extends along the upper edge of the side *p* of the trough-like connection D, and is continued along the upper edge of the base H, and also along the upper edge of the side *m* of the trough, and terminates at an extension, *f*, of the cylinder-head *a*; and in order to add vertical strength to the frame a central web, *t*, extends from the base H to the cylinder-head *a*, this web merging into the foot *w*, which serves as one of the supports of the frame.

In horizontal engines there is necessarily an excessive lateral strain on the frame between the cross-head guides and the crank-shaft. This strain is effectually resisted by the comparatively light trough-like portion of the frame between the crank-shaft and guiding-cylinder.

I claim as my invention—

1. A horizontal steam-engine frame in which a cylinder, *b*, for guiding the cross-head, is combined with the cylinder-head *a* and semicircular connecting-piece *d*, substantially in the manner described.

2. The combination, in a horizontal engine-frame, of the guiding-cylinder *b*, base H, and trough-like connection D.

3. A horizontal engine-frame composed of the cylinder-head *a*, guiding-cylinder *b*, connecting-piece *d*, trough D, base H, and web *t*, all combined substantially in the manner described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WM. WRIGHT.

Witnesses:

GEORGE H. CLARK.

JAS. B. B. BRUNDAGE.

115 UNITED STATES PATENT OFFICE.

WILLIAM WRIGHT, of New York, N. Y.

Improvement in Portable Steam-Engines.

Specification forming part of Letters Patent No. 49334, dated August 8, 1865.

To all whom it may concern:

Be it known that I, William Wright, of New York, in the county and State of New York, have invented certain new and useful improvements in steam machinery; and I hereby declare that the following, taken in connection with the accompanying drawings, is such a full, clear, and exact description of the same as will enable others skilled in the art to make and use the same.

This invention relates to the construction of portable steam-engines or other steam-engines in which the boiler forms the frame or support to the steam-cylinder crank-shaft and all other appurtenances of the steam-engine which receive or impart the propelling-power, and which constitute the prime mover.

In such steam-engines, as heretofore constructed, there was necessarily much strain upon the various parts of the boiler, due in part to the direct action of steam on the piston in the cylinder, which forms one fixture to the boiler, and to its indirect action on the support of the crank-shaft, which forms another fixture to the boiler, the tendency of which is to alternately distend and contract the intermediate portions of the boiler, and, in part, to the jars and vibrations attending the operation of the machine, the effect of which is increased with the number of independent points of attachment of the engine or its parts to the boiler. For these reasons portable steam-engines are of comparatively little durability and require frequent repairs. The object of this invention is to remedy this important defect, and I have accomplished the same by a new mode of combining the engine with the boiler—*i. e.*, by a mode of attaching the former to the latter.

In the accompanying drawings—

(Here follows diagram marked p. 114.)

Figure 1 is a side elevation of a portable engine and boiler complete. Fig. 2 is a plan view of the engine, exhibiting the manner of attachment of the engine to the boiler, shown in section; and Fig. 3 is a vertical transverse section on line *x y* in Fig. 1.

For the purposes of this specification no particular reference is needed to the boiler. It will suffice to say that it may be of the general form shown in the drawings, or of any other known or suitable form or arrangement and construction. In this instance the boiler is supposed to belong to the tubular class, being of a parallelopiped form, surmounted by a dome, B, from which springs the chimney C.

W. Wright,

Portable Steam Engine.

No. 49,334. Patented Aug. 8, 1865

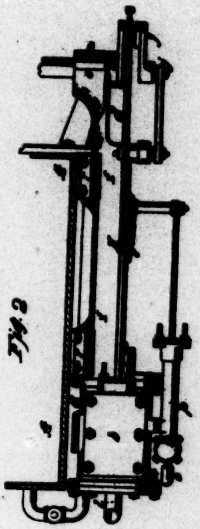


Fig 2

Fig 3

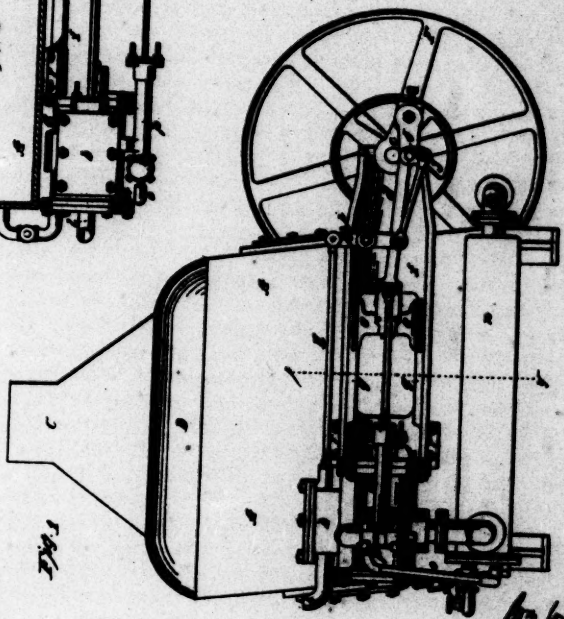


Fig 1

Witnesses:

Inventor:

The engine is mounted against and attached to one of the vertical sides of the boiler, to counterbalance which the fly-wheel F is established on the opposite side. There is no particular novelty in the construction, arrangement, or operation of the engine proper. Like most portable engines, it consists of a steam-cylinder, *a*, containing a piston whose reciprocating travel within the cylinder is governed by the valves in the steam-chest *b*. The movement of the piston is transmitted to the main crank *c* by means of a connecting-rod, *d*, jointed to the cross-head *e*, to which the piston is attached, and which is guided in ways or guides *g*, fast to the frame *f*. A rocking beam, *h*, having its fulcrum at *i*, and receiving its motion from the main crank *c* through the intermediary of the double auxiliary crank *j*, fast on the pin of the said main-crank, actuates the valve-rod. Steam is admitted into the chest through the pipe *l*, and is exhausted through the pipe *m* and traversing vessel *n*, through which the feed or water-supply pipe *o* passes, so as to utilize the waste heat of steam for the purpose of heating the water previous to being injected into the boiler. The force-pump *p* is operated from the cross-head *e*, to which its plunger or piston rod is attached.

Those portions of the engine just described and referred to are in no respect novel or original, and consequently form no part of my present invention, my reason for inserting them being to further the complete elucidation of my actual improvement, to which I shall now more particularly refer.

With the head of the cylinder *a* is cast, in one piece, the bed-plate or frame *f*, which is a shell of semi-cylindrical form, so as to partially inclose the moving parts of the engine. At each end the frame is provided with brackets *r*, whereby it is securely bolted to the boiler. The outer end of the frame, or the end opposite to that which forms the cylinder-head, is formed into a bracket, *s*, projecting from the rear end of the boiler, and carrying the boxes or pillow-blocks or bearings of the main driving-shaft, and is properly recessed to allow free play to the crank *c*. The inner and overhanging edges of the semi-cylindrical frame situated in the
116 vertical plane passing through the axis of the steam-cylinder are provided with guides or ways *g*, upon which the cross-head whereby the coupling of the steam-piston rod with the movable parts of the steam-engine is effected have their reciprocating travel. The cylinder head and frame is attached to the steam-cylinder, or, *vice versa*, the cylinder is attached to the frame, by means of bolts passing through the flange.

From the foregoing description it will be understood that the whole engine may be fitted and truly adjusted without reference to the boiler, and that the whole engine, when fitted to the frame of which it is an integral part, can with ease and at a comparatively little cost be secured or fitted to the boiler.

As to the working of this improvement, it will be seen that inasmuch as the cylinder is, as it were, suspended—*i. e.*, having no rigid connection with the boiler—the strain attending the operation of the other reciprocating engines is entirely done away with.

Having thus fully described my invention and the manner in which the same is or may be carried into effect, I claim—

The arrangement of portable steam-engines with reference to the manner herein described of attaching the engine proper to the boiler.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

WM. WRIGHT.

Witnesses:
A. POLLOK.
CHAS. J. F. HARDWICH.

118 UNITED STATES PATENT OFFICE.

GEORGE H. BABCOCK, of Plainfield, New Jersey.

Improvement in Steam-Engines.

Specification forming part of Letters Patent No. 133,741, dated December 10, 1872.

To all whom it may concern:

Be it known that I, George H. Babcock, of Plainfield, Union county, New Jersey, have invented a certain improvement in valve-motions for steam-engines, of which the following is a specification:

I will describe the invention as applied to a small upright stationary-engine regulated by an ordinary centrifugal governor.

One of the advantages, which will be appreciated by engineers as due to this invention, is the equalization of the action on the up-and-down strokes—that is to say, it compensates for the changing angle of the connecting-rod in different portions of the stroke. The point of the cut-off is the same in the up-stroke as in the down-stroke under all conditions; and so of the point of exhausting, compression, &c. Only one eccentric is employed.

The accompanying drawing forms a part of this specification.

(Here follows diagram marked p. 117.)

Figure 1 is an end elevation, and Fig. 2 is a side elevation. Fig. 3 is a diagram, showing the motion of one of the parts on a large scale.

Similar letters of reference indicate like parts in both the figures.

A is the fixed frame, and A′ the fixed vertical guides cast therein, which perform the ordinary function of guiding the cross-head. B is the cylinder, and C a belt, which communicates motion to the governor F through beveled gearing, as will be understood. D is the main shaft, receiving the action of the engine through a crank and connecting-rod; which, as also other parts of the engine not represented, it will be understood may be of the ordinary or any suitable construction. A single eccentric, *d*, operates a stout encompassing part formed in two pieces and bolted together, which I will term an eccentric strap. The lower part I will mark M¹ and the

G. H. BABCOCK.
Steam-Engines.

117

No. 133,741.

Patented Dec. 19, 1872.

Fig. 3.

Diagram.

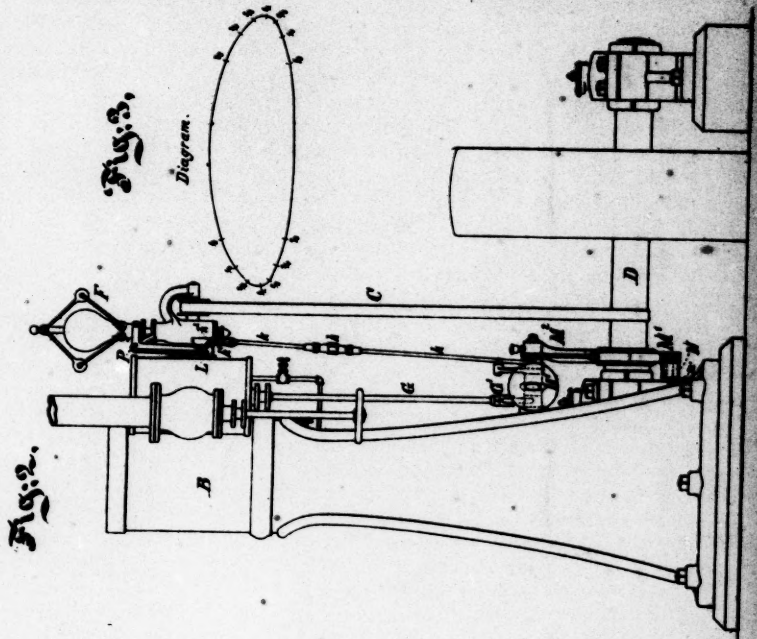


Fig. 2.

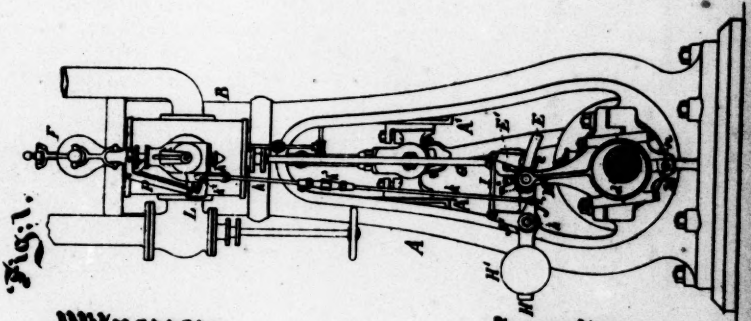


Fig. 1.

Witnesses:

C. Smith

Inventor.

Geo. H. Babcock

by his attorney, A. G. Stevens

New York

upper part M^2, referring to the whole, when necessary, by the single letter M. The lower part M^1 has a groove, which, as the eccentric *d* revolves, is traversed up and down in a constantly-changing inclination on a block, N, which is free to swivel a little on a pin, *n*, fixed firmly in the framing. The arrangement causes the upper arm M^2 to describe a path somewhat analogous to an ellipse, with its transverse axis horizontal, but with the lower side of the ellipse flattened. The upper end of the arm M^2 carries a block, m^2, provided with adjustable gibs and adjusting nuts and screws. This block, with its gibs, takes hold slightly but firmly of a slightly-curved piece marked E, which is smoothly finished, and allows the block m^2 to traverse smoothly from its one extremity to the other. As the shaft D revolves the center of the block m^2 describes a path in space which is indicated on a large scale in the diagram, Fig. 3. This path is invariable under any given adjustment of the pin *n*. Its effect, however, on the valve, both with regard to the amount of throw and the time in which the valve arrives at any given point, is greatly modified according as the piece E is inclined more or less. The valve may be an ordinary slide-valve. G is the valve-stem, connected adjustably to the yoke G′, to which the adjustable curved piece E is pivoted, so that it rises and sinks therewith as the valve is worked. Some portion of the benefit of my invention may be realized by fixing the piece E in an invariable position on the yoke G′, or directly upon the valve-stem, and holding the valve-stem by some suitable guide against any lateral motion, allowing the motion of the block m^2 to be communicated invariably to the valve-stem G. I have, however, added provision for conveniently adjusting the point of cut-off, and for effecting this with great perfection by means of a governor. The piece E is pivoted upon a yoke, G′, so that it can be easily turned into various degrees of obliquity. The piece E has an arm, E′, extending upward at right angles therefrom. On the center of motion of the piece E E′ on the pivot *e*, which connects the piece E E′ with the yoke G′, is carried a lever, H, which turns on a fixed point, *h*, in the framing, by means of which lever extending beyond the pivot *h* a heavy ball, H′, is supported, which tends to balance the weight of the slide-valve and its connections. As the valve is worked the lever H rocks, and the pivot *e*, instead of describing an exactly-vertical line, traverses up and down in an arc, of which the center is *h*. The upper end of the arm E′ is connected by a rod, I, to the upper arm J^1, of a bell-crank lever which is mounted on the same center *h* as the lever H. The lower arm J^2 of this lever is connected by a rod, K, to a slide, K′, the position of which is controlled by the governor at rapidly-recurring in-
119 tervals; while it is also held very strongly against any movement except such as the governor shall indicate. The action of the block m^2 on the curved piece E tends to disturb the position of the piece E and of the several connections I J K. At each revolution the rod K is pressed upward, and then again downward with considerable force. Such force would tend to disturb the action of the governor but for the provisions which I have introduced. The slide K′ is guided so that it is only capable of a strictly vertical mo-

tion. It carries a pin, k^2, which is received in an oblique slot, l, in a horizontal slide, L, which latter is operated to the right or left by the bell-crank lever P, according as the governor-balls rise or sink, as will be obvious. As the center of the block m^2 revolves in its distorted elliptical path there are four points where there is no tendency to disturb the position of those parts. Two of these points are at the opposite ends of the throw of the valve. Here the block exerts no tendency to disturb anything, for obvious reasons. There are also two points in its traverse when the center of the block m^2 is coincident with the prolonged axis of the pivot e. Here any force exerted by the eccentric, and, consequently, by the block m^2, however great it may be, in the upward or downward direction is evidently unfelt by the arm E′ and by the connections I J K, because it is exactly on the center of the turning piece E E′. When the engine is cutting off at its shortest these points nearly coincide with the points before named—viz., those at the end of the motion of the valve. When the steam is allowed to follow further these points may come in widely-differing parts of the circuit. The rod K is provided with an adjusting-nut, k^3, as represented, by which the length of the rod can be very nicely adjusted at will.

Operation.

The engine being supposed to be working with a uniform load at a uniform speed, there is no change in the rate of expansion, and the piece E maintains a fixed and uniform amount of inclination, but rising and sinking with each turn of the engine. If the piece E is in a horizontal position, or as nearly so as its curvature will allow, the valve receives an amount of up-and-down motion only equal to the conjugate axis of the imperfect ellipse described by the center of the block m^2. This motion is only sufficient to allow for the lead and loss, and will give very little steam to the engine. In other words, it cuts off at the beginning of the stroke. When the governor-balls sink and the slide moves, in consequence, to the left, so that the slide K′ and the rod K sink a little, the arm E′ is inclined more to the right and the piece E is inclined, and is thereafter held firmly in an oblique position. In this oblique position the valve gets a greater throw by reason of the fact that the block m^2, in making its long traverse laterally, induces a motion in the piece E and its connections additional to and peculiarly combined with the motion which is due simply to the vertical travel of the block m^2 before referred to. It may not be necessary to give in this specification a prolonged mathematical analysis of the action. What I consider the best proportions are shown in the drawing; and as the obliquity of the piece E is increased or diminished the throw of the valve is increased or diminished.

The parts are so related that, as before remarked, any change of cut-off is felt equally on the up-stroke and down-stroke; and the same with the other changeable points, the point of admission, compression, and exhaust.

Some of the advantages due to certain features of the invention

5305

PATENTED OCT 3 1871

fig. 1.

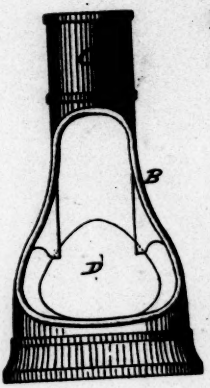
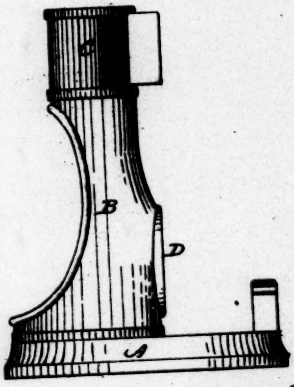


fig. 2.



Albert A. Wilson
Inventor,
By his Atty.
Wm. C. Ewart

Witnesses
A. J. Tibbits
J. H. Shumway

may be realized by the employment of only a portion of the combination; but I prefer the whole, as described. There may be little advantage in making the pin *n* adjustable. I, in fact, prefer to determine accurately the best position for this pin and its connected block N, and to fix it permanently in the frame A. A slightly-differing effect, but nearly as good, may be produced by fixing the pin *n* on the lower arm M^1 of the eccentric-strap and allowing the block M to traverse vertically in ways carried on the frame.

The arm E′ extending upward from the curved piece E is of exactly the same length as the upper part or arm J′ of the bell-crank lever J. The rod I is also of exactly the same length as the corresponding part of the lever H. These relative proportions are important. They form a figure which, however it may be changed to be more or less diamond-shaped instead of square or rectangular, is always a parallelogram; and, however obliquely the curved piece E is set, it moves always in a position parallel to itself.

I claim as my invention—

1. The piece E attached to the valve-moving mechanism, in combination with a block, m^2, as specified, and caused to describe an approximate ellipse so as to operate therewith, substantially as herein set forth.

2. The eccentric-strap M^1 M^2, controlled on one side by the pin *n* and block N, and carrying on the other side a block, m^2, adapted to operate in combination with a properly-curved piece, E, as and for the purposes herein specified.

3. The adjusting-arm E′ and controlling-rod I, with suitable means for adjusting the latter, arranged to serve relatively to the piece E, valve-stem G, and block m^2 on the eccentric-strap M^1 M^2, as herein specified.

4. The lever H connected to the valve-stem G, and guiding the latter, in combination with the block m^2, operated as shown, and with the piece E E′ and connections I J K, or their equivalents.

In testimony whereof I have hereunto set my hand this 28th day of August, 1872, in the presence of two subscribing witnesses.

GEO. H. BABCOCK.

Witnesses:
S. WILCOX.
ARNOLD HORMANN.

121 *Specification Forming Part of Design No.* 5305, *Dated October* 3, 1871.

To all whom it may concern:

Be it known that I, Albert A. Wilson, of New Haven, in the county of New Haven and State of Connecticut, have invented a new design for upright steam-engine; and I do hereby declare the following, when taken in connection with the accompanying drawing and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawing constitutes part of this specification, and represents in—

(Here follows diagram marked p. 120.)

Figure 1, a front view; and Fig. 2, a side view.

This invention relates to a design for the bed or frame of that class of steam-engines commonly called upright engines, in which the cylinder is at the top or upper end of the frame, the shaft being at the base, and it consists in the peculiar configuration of the frame, as shown in the accompanying illustration.

From the end of the base A, which is rounded at both ends, rises the frame B, supporting at its top the cylinder C. This frame is of cylindrical form, cut away upon the front to open the frame, as seen in Fig. 1, and an opening, D, upon the opposite side, through which the shaft passes, all as clearly shown in the accompanying illustration.

I claim as my invention—

The design for upright steam-engine, as described and shown in the accompanying illustration.

A. A. WILSON.

Witnesses:

A. J. TIBBITS.

J. H. SHUMWAY.

123 123,635.

UNITED STATES PATENT OFFICE.

JAMES R. MAXWELL, of Cincinnati, Ohio, and EZRA COPE, of Covington, Kentucky.

Improvement in Steam-Engines.

Specification forming part of Letters Patent No. 123,635, dated February 13, 1872.

To all whom it may concern:

Be it known that we, James R. Maxwell, of Cincinnati, in the county of Hamilton and the State of Ohio, and Ezra Cope, of Covington, in the county of Kenton and State of Kentucky, have invented a new and useful improvement in steam-engines.

The nature of our invention consists in the manner of constructing, combining, and arranging the parts of a steam-engine.

To enable others skilled in the art to make and use our invention, we proceed to describe our invention; and hereby declare the following specification, together with the accompanying drawing with like figures thereon referring to like parts making part of these specifications, a full and exact description of the same.

(Here follows diagram marked p. 122.)

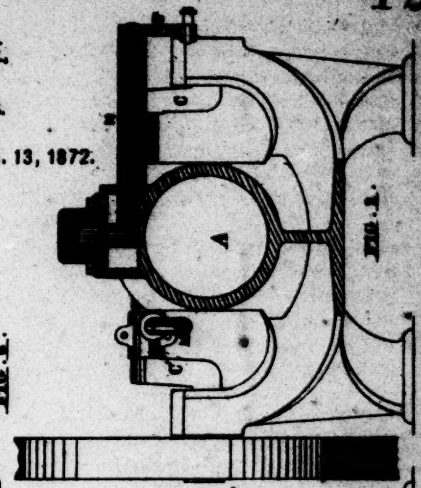
In figure 1, A represents a steam-cylinder cast in one piece with its bed, affording two crank-shaft bearings at one end and a combined connecting piece and cross-head guides at the opposite end. Customary steam and exhaust ports and passages of a slide-valve engine are formed in and lead from a raised valve-seat cast at the same time

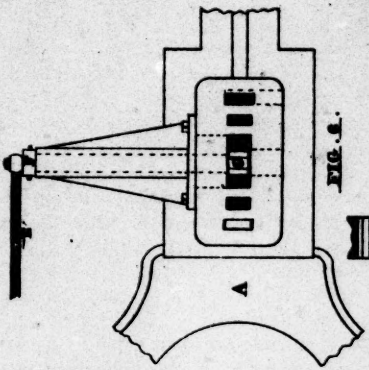
12

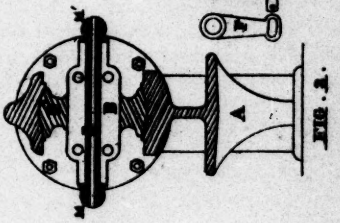
J. R. MAXWELL & EZRA COPE.

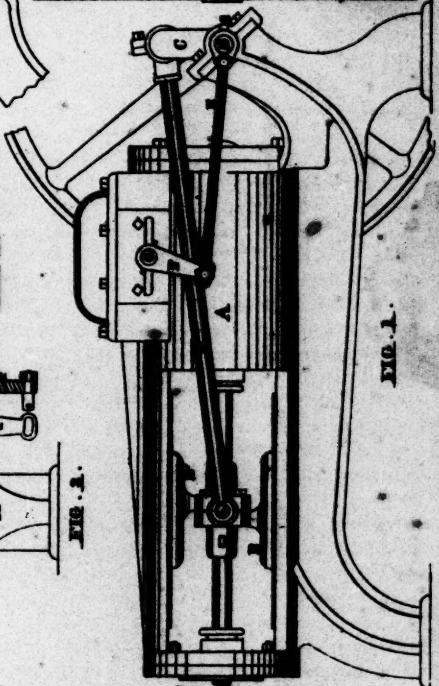
Improvement in Steam Engines.

No. 123,635. Patented Feb. 13, 1872.









Witnesses.

Joseph Mosed

Inventors.

James R. Maxwell

Ezra Cope

on the steam-cylinder. The inner cylinder-head with its stuffing-box is fitted and secured within the steam-cylinder. The other cylinder-head is secured in the usual manner to the opposite end of the steam-cylinder. B and B′ represent a cross-head formed in two sections. As requisite to insert and adjust the cross-head, when fitted to be bolted together between the guide-ways, each section of the cross-head is a counterpart of and substitute for the other, and has one slide and one socket-hub or piston-rod boss. The cross-head is bored out transversely to receive the journal L.

In Fig. 3, B and B′ represent the cross-head in transverse section, with the journal L neatly fitted therein to have a motion in its bearing when the connecting-rods M and M′ are secured on the protruding ends of the journal L by pins or otherwise, and connected up in operative condition. The cross-head is turned off to conform to the guide-ways, which are fitted for the cross-head by boring at one setting to bore the steam-cylinder.

Fig. 5 represents the valve-seat raised to admit the play of the indented finger G within the enlarged exhaust-passage, and to engage with and throw the valve H within the steam-chest.

In Figs. 2 and 6, N represents a sleeve bolted to the side of the exhaust-passage to form a bearing for the rocker-shaft, as shown in Figs. 2, 4, and 6. The indented finger G is preferably formed on one end of the rocker-shaft. On the opposite end of the rocker-shaft is secured the arm F, with a curved slot to serve in adjustments of the valve-gear.

In Figs. 1 and 2, C and C′ represent a crank-shaft sustained in two bearings, and having two journals for the main connecting-rods M and M′ between the two bearings, with a balance-wheel on one end and an eccentric or crank on the opposite end to impart proper motion through the connecting-rod E to the valve H when all the parts are connected up and adjusted ready for the admission of steam into the steam-chest in the usual manner, and thus initiate the movement of the relating parts as combined and arranged to successful operation for the varied uses and purposes of such enginery, but more especially suited as a motor for any piston or plunger-pump bolted to the flanged end of the connecting piece, with the piston-rod of the pump attached to the cross-head.

Having thus fully described the manner of making and using our invention, what we desire to claim, and secure by letters patent, is—

1. We claim the cross-head of a steam-engine, when constructed, as shown, of two pieces bolted together, each piece provided with one slide, one hub or piston-rod boss, and part of the bearing for the pitman-journal, all formed in the casting for the purpose as described.

124 2. The arrangement of the cross-head guides fixed asunder in the casting, the cross-head B B′, a piston-rod attached at either or each side thereof in line with the hubs, the connecting-rods M and M′, and the main shaft C with the balance-wheel thereon, all constructed and operating substantially as shown and described.

3. We also claim the slide-valve H, in combination with the sleeve

N and finger G, the arm F, connecting-rod E, and the eccentric or crank D on the shaft C, all constructed and operating substantially as shown and described, for the purpose herein set forth.

JAMES R. MAXWELL.
EZRA COPE.

Witnesses:
N. MARCHANT.
JOSEPH MOSES.

128 124,801

UNITED STATES PATENT OFFICE.

CHILION M. FARRAR, of Buffalo, New York.

Improvement in Steam-Engines.

Specification forming part of Letters Patent No. 124,801, dated March 19, 1872.

Specification.

I, Chilion M. Farrar, of Buffalo, in the county of Erie and State of New York, have invented certain new and useful improvements in steam-engines, of which the following is a specification:

Nature and objects of the invention.

My invention relates to certain improvements in horizontal steam-engines, too fully hereinafter described to need preliminary explanation.

Description of the accompanying drawing.

(Here follow diagrams marked pp. 125, 126, & 127.)

Figure 1 represents a side elevation of my invention complete, drawn to a scale of one inch to the foot; Fig. 2, a plan view of the same, also on a scale of one inch to the foot. Fig. 3 is a side elevation of the cylinder, drawn to a scale of three inches to the foot, the lower part being partly in section so as to show the arrangement of the steam-passages, &c. Fig. 4 is a plan or top view of the same, drawn to the same scale. Fig. 5 is a front view of the frame and cylinder, on the same scale. Fig. 6 is a back view of the cylinder, showing the steam-chest below it, &c.

General description.

A represents the frame. It is cast in one piece with the ribs B, and C, and D, thereby insuring great and sufficient strength without unnecessary weight. It is supported by the foot-pieces E, F, G, and H. J is the cylinder. It is bolted to the frame at K. L represents the steam-chest. It is placed on the lower part of the cylinder, and is cast in one piece with it, as shown in Figs 1, 3, and 6. The arrangement of the valves is shown in the sectional part of Fig.

3 Sheets—Sheet 1.

C. M. FARRAR.

Improvement in Steam Engines.

No. 124,801. Patented March 19, 1872.

FIG. 1.

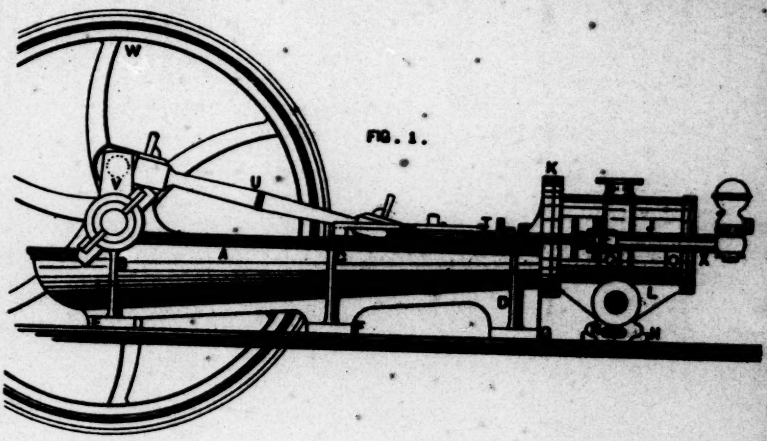
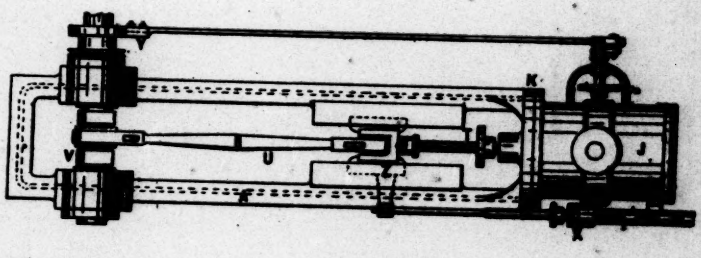


FIG. 2.



Witnesses,
James Langatte
Wm. H. Johnson

Inventor,
Chilion M. Farrar

C. M. FARRAR. 3 Sheets—Sheet

Improvement in Steam Engines.

No. 124,801. Patented March 19, 1872.

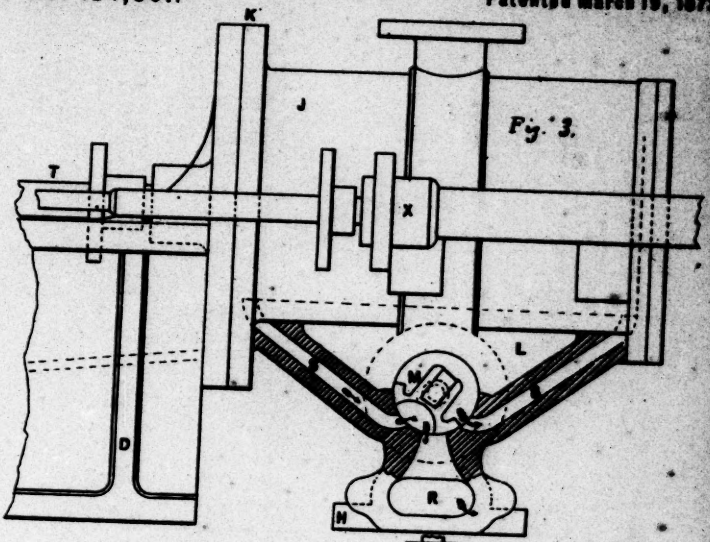


Fig. 3.

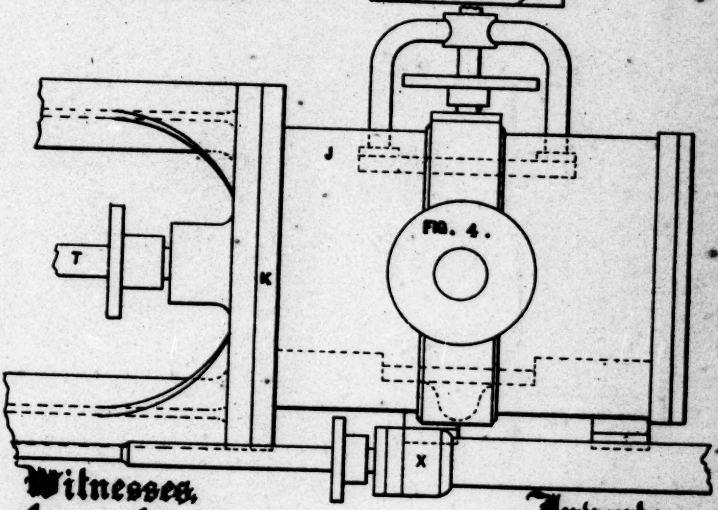


FIG. 4.

Witnesses,

James Sample

Wm. H. Johnson

Inventor.

Chilion M. Farrar

C. M. FARRAR. 3 Sheets—Sheet 1

Improvement in Steam Engines.

No. 124,801. Patented March 19, 1872.

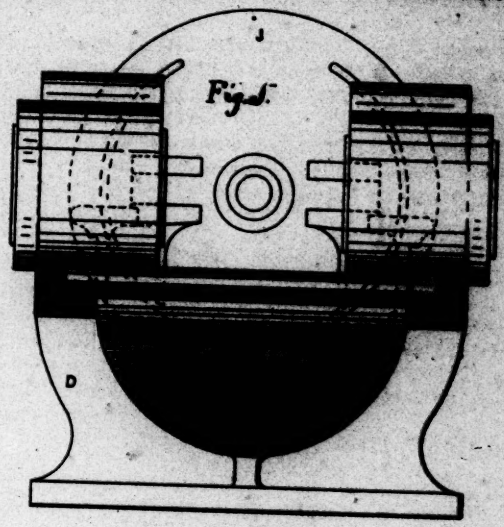


Fig. 1.

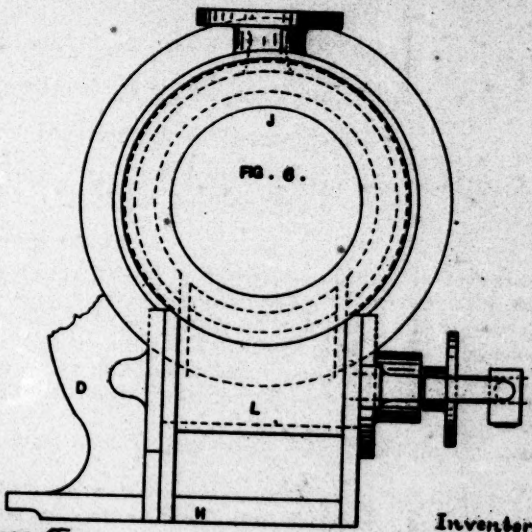


FIG. 6.

Witnesses.

James Bennett

Wm. H. Johnson

Inventor.

Chilion M. Farrar

3, and is represented by the letter M. It is made in the form of a rolling valve, although any form of slide-valve may be used in its place; but I prefer the arrangement shown in the drawing. S S represents the inclined steam-passages, and R the exhaust-passage or port.

It will be readily seen that the arrangement of the valve below the cylinder and the steam-passages S S, inclined as shown in said Fig. 3, affords a better and easier outlet for the condensed steam to escape or pass out the exhaust-port.

The various parts common to a steam-engine are represented in the drawing as follows: T is the piston-road; U, the connecting-rod; V, the crank; W, the fly-wheel; X, the pump; Y, the eccentric; and Z, the cross-head, &c.

Claim.

I claim as my invention—

In a steam-engine constructed substantially as herein shown and described, I claim the combination of the steam-chest L, inclined steam-passages S S, and the exhaust-passage R of the valve, said parts being constructed and arranged in respect to the cylinder J, and operating as set forth.

C. M. FARRAR.

Witnesses:
JAMES SANGSTER.
WM. H. JOHNSON.

130 UNITED STATES PATENT OFFICE.

EDWARD H. CUTLER, of Canton, Ohio.

Improvement in Steam-Engines.

Specification forming part of Letters Patent No. 133,305, dated November 26, 1872.

To all whom it may concern:

Be it known that I, Edward H. Cutler, of Canton, in the county of Stark and State of Ohio, have invented certain new and useful improvements in steam-engine frames and guides; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon which form a part of this specification.

My invention consists of an improved form of guide for steam-engines.

By this invention the method heretofore prevailing of casting the guide in one piece with the frame is done away with, and the device of a guide cast separately with brackets with which to attach it to the frame is substituted. My object in making my guides in this form is evident. By the method now in use of casting the guides and frame in one piece, if the guides become damaged or worn out,

the whole frame has to be thrown away, necessitating a loss of money and perhaps of time; but by my method, if they become broken or in any way rendered unfit for use, they may be thrown aside and new ones substituted in a short time and economical manner.

The advantages gained by using a guide of this construction are manifest—time and money are both saved, as also a considerable increase of strength and durability. I also claim some advantages for the style of frame shown in the drawing. It is cheap, simple, and is possessed of great strength and durability, and I prefer to use it in connection with my guides; but, of course, do not confine the use of the guides to any particular form of frame, but use them upon any and all frames where guides of this pattern are required.

(Here follows diagram marked p. 129.)

Figure 1 is a side elevation of the guide and frame. Fig. 2 is a section of the guide and an end view of the frame.

A represents the frame of the engine. B is the guide constructed in the usual manner with V-shaped ways and having the brackets *a* and *a'*. The guide B is attached to the frame by means of the bolts *b* and *b'* passing into the frame.

What I claim as new, and desire to secure by letters patent, is—

1. The guides B constructed with the brackets *a* and *a'*, substantially as and for the purpose specified.

2. The combination of the guides B, constructed as described, with the frame A of the engine, as and for the purpose described.

E. H. CUTLER.

Witnesses:
A. F. HALL,
PHILO P. BUSH.

132 SAMUEL WRIGHT.

Improvement in the Construction of Locomotive Engines.

Specification forming part of Letters Patent No. 540, dated December 26, 1837.

To all whom it may concern:

Be it known that I, Samuel Wright, of the city of Philadelphia, in the State of Pennsylvania, have invented certain improvements in the locomotive steam-engine; and I do hereby declare that the following is a full and exact description thereof.

The several distinct improvements which I have made consist, first, in the manner of constructing and arranging the supply pump; secondly, in the construction of the slide valve; thirdly, in the manner of disposing the eccentric and its connections; fourthly, in the manner of securing the joints of the steam-pipes to the cylinder, and, fifthly, the manner of forming the stuffing box of the steam-chest.

(Here follows diagram marked p. 131.)

E. H. CUTLER.

Steam-Engines.

No. 133,305. Patented Nov. 26, 1872.

Fig. 1.

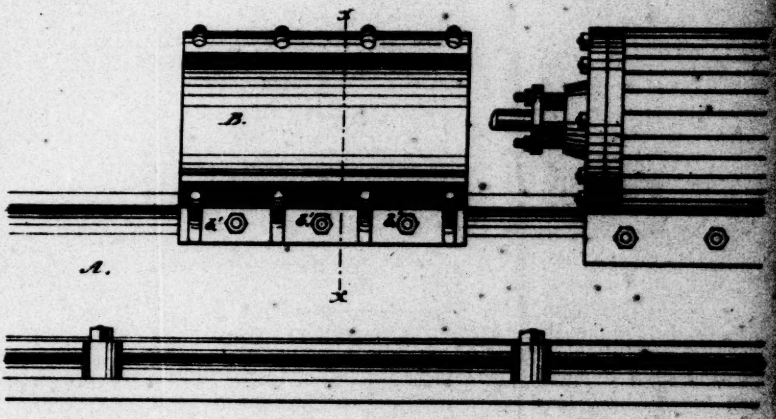
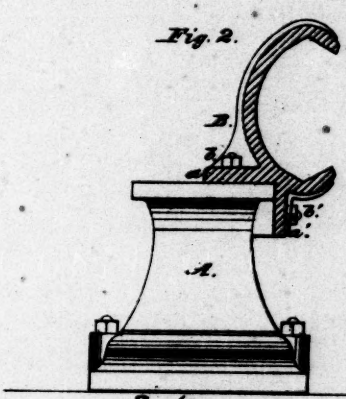


Fig. 2.



Section x x.

Witnesses:

Inventor:

S. Wright,

Locomotive.

No 540. Patented Dec. 26, 1837.

Fig. 1.

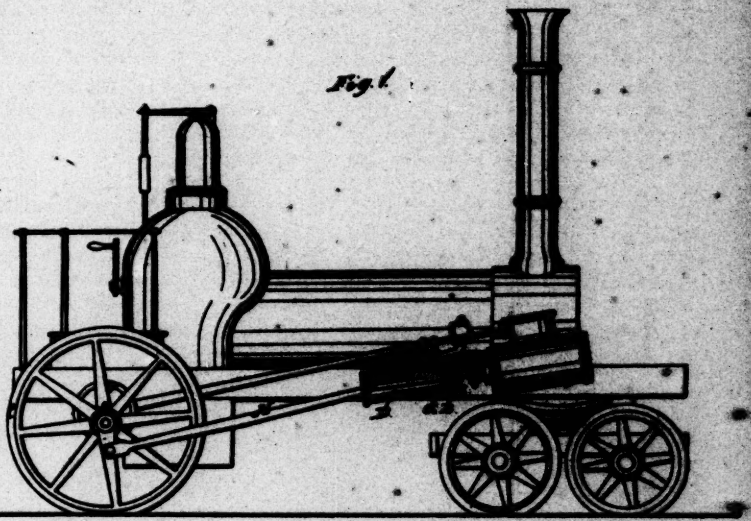


Fig. 4

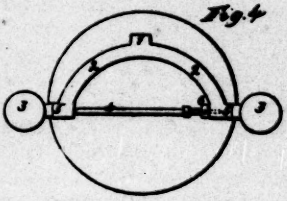


Fig. 3.

Fig. 5

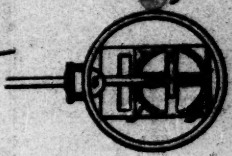


Fig. 2

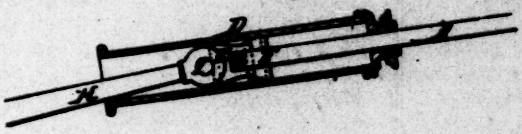


Figure 1 in the accompanying drawing is a side view of my locomotive engine, which, excepting the parts designated as constituting my improvements, does not differ from such as have been previously in use.

A, Fig. 1 and 2, is the piston-rod of the steam cylinder passing through the stuffing box B of the supply pump D, of which C is the lid, E is the piston of the pump, and F its follower. G is the key for attaching the piston-rod to the piston; H is the connecting rod for communicating the motion to the driving wheel; I, the wrist pin by which it is connected to the piston. The diameter of the chamber of the pump D must be such as to allow the connecting rod H to traverse freely without coming into contact with it. A jaw or recess is formed in the end of the piston E, forming a joint
133 with the end of the connecting rod, which vibrates on the joint pin I; the packing of the piston is managed as in other pumps. In this machine the water pipes are placed at the upper end of the pump; these, with their valve chambers and their auxiliaries, may be dispensed with in various ways without changing those parts which constitute my improvement.

By the above-described mode of constructing the supply pump and the various parts connected therewith I dispense with the guides, cross-heads, couplings, and coupling rods without requiring any substitute therefor, and by doing this the whole is manifestly much simplified and less likely to get out of order, the friction is much diminished, and from the increased length of the connecting rod and other causes therewith the action is more direct than in other constructions.

What I claim as my invention in this my first improvement is the constructing and connecting the respective parts, consisting principally of the supply pumps, its piston, the piston-rod of the steam cylinder, and the connecting rod from the driving wheel, substantially in the manner described, so as to subserve the twofold purpose of a pump and guide, dispensing entirely with the parts usually called guides and their ordinary appendages.

My second improvement consists in the manner of constructing and arranging the slide valve and its appendages. In the drawing, *a*, Fig. 3 and 5, represents the valve, being a side and top view thereof in these figures; *b* is the piston, *c* the follower attached to the lower part of the piston, *d* the slot or groove for the valve rod, *e* the slot or groove for the regulating nut, *f* the abutments of the valve, *g* the bonnet of the steam-chest, and *h* the rim of the piston to form a joint with the valve when down. The piston is to be inserted in
134 valve *a* and packed steam-tight; when steam is admitted on the upper side of the valve *a* and the piston *b*, it will by its elastic force press the piston *b* into the valve *a* until the rim *h* forms a junction with the valve *a*. To effect this the surface of the rim *h* is furnished with a steam-tight bearing, there being a corresponding surface on the valve *a*. The valve then acts in a manner similar to that of the common slide valve. In reversing the action of the engine the steam is to be admitted on the inner surface of the valve *a* through the medium of the exhaust opening; and as the action of the steam then tends to force the valve from its seat, it is neces-

sary to balance this by some contracting force, and this is effected by the piston *b*, which recedes from the pressure until arrested by the bonnet *g*. To avoid any tending in the valve to rise from any friction of the packing, the abutments *f f* are introduced, upon which the steam reacts.

What I claim as new in this my second improvement is the particular manner of constructing and arranging the valve, the piston, the bonnet of the steam-chest, and the abutments, as herein described and for the purposes set forth.

My third improvement consists in the manner of disposing or arranging the eccentric and its connections, by which I am enabled to dispense with much of the subordinate machinery or apparatus ordinarily connected with this part of the engine. In the drawing, Fig. 1, *b* represents the eccentric which is bolted or otherwise fastened on the inner side of the driving wheel *b*. The arms of the driving wheel are to be recessed so as to admit of its introduction, the eccentric *b* being made to embrace the hub *s*. A direct communication with the valve is thus obtained by the aid of a straight rod extending to it from the eccentric. What I claim in this part is the attaching the eccentric to the driving wheels and making a direct communication therefrom to the valve in the manner described.

My fourth improvement consists in a new and improved method of securing the joinings of the steam-pipe and cylinder. The manner of doing this is shown in Fig. 4, where No. 1 is the pipe communicating with the throttle; No. 2 2 are the branch pipes to the cylinder; 3 3 the steam cylinders; 4 is a bolt having a nut topped on one of its ends; 5 5 are the flanges of the steam-pipe and 6 the nut of the bolt 4. In applying this apparatus the nut 6 is to be forced against the flange 5, when the reaction of the bolt against the opposite flange will extend the pipes 2 2 until the flanges 5 5 are in such contact with the cylinder 3 3 as to be steam-tight. By this arrangement the joints are united and detached more readily than by any other mode heretofore known, whilst the parts are constructed at a less cost.

I claim in this part the particular arrangement of the apparatus by means of which the screw bolt and nut 4 and 6 are made so to operate as to produce the results set forth.

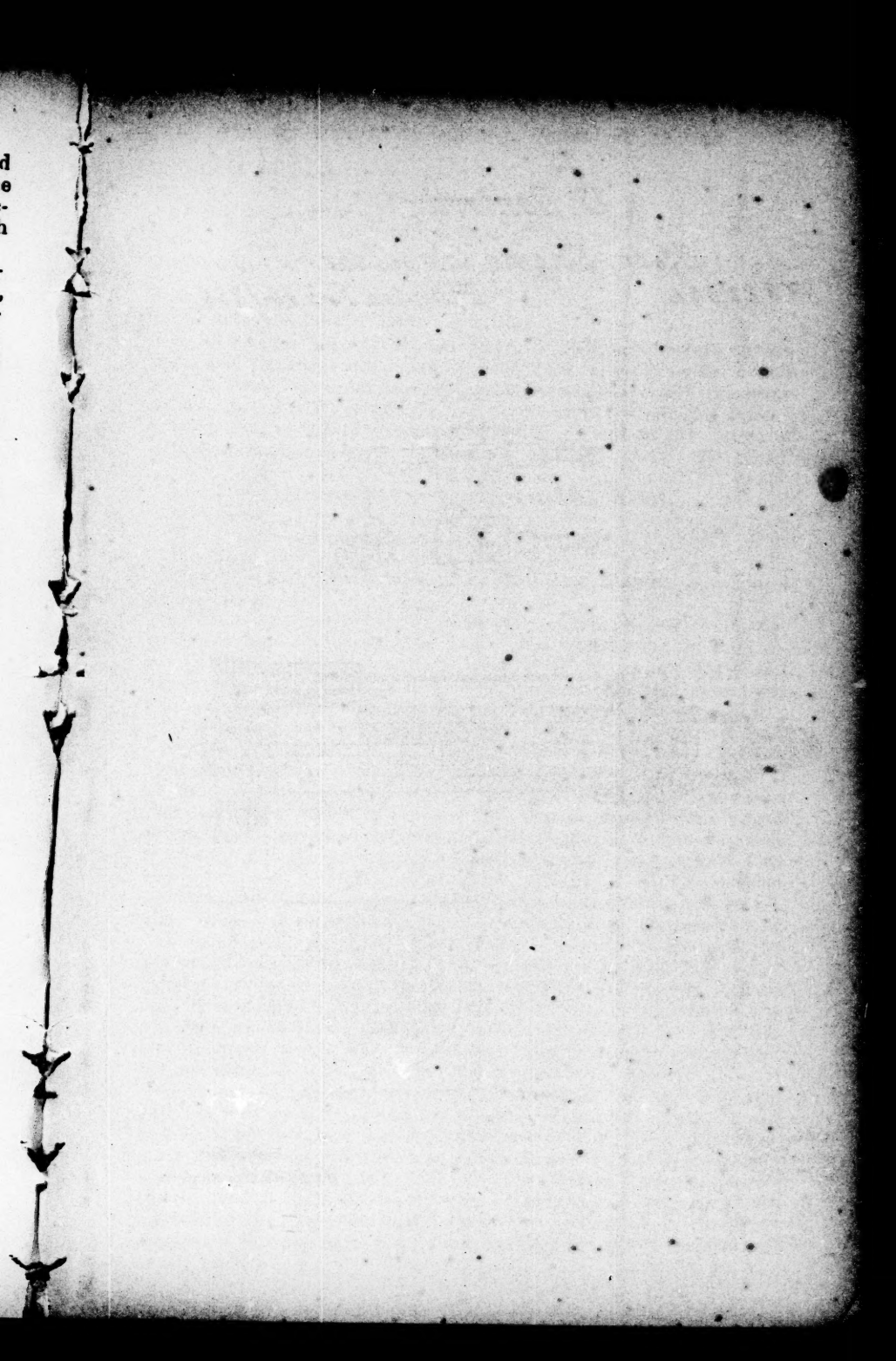
My fifth improvement consists in the manner of forming the stuffing box of the steam-chest inside. This steam-chest, as constructed by me, is perfectly circular on its outer surface, is without flanges or stuffing box, and may be finished perfectly in the lathe.

No. 7, Fig. 3, is a representation of the steam-chest, and No. 8 the female portion of the stuffing box, which is cast with the steam-chest. What I claim as my improvement in this part is the manner of constructing or forming the stuffiing box of the steam-chest as described, the peculiar character of which will be obvious to every competent machinist.

SAMUEL WRIGHT.

Witness-:
W. THOMPSON.
LINTON THORN.

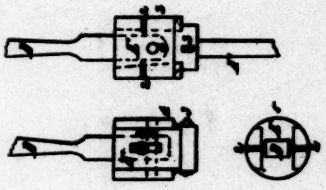
Ex'd: L. E. M.; M. McK.



G. Sanford,

Steam-Engine Valve-Gear.

No 22,981. Patented Feb. 15, 1859.



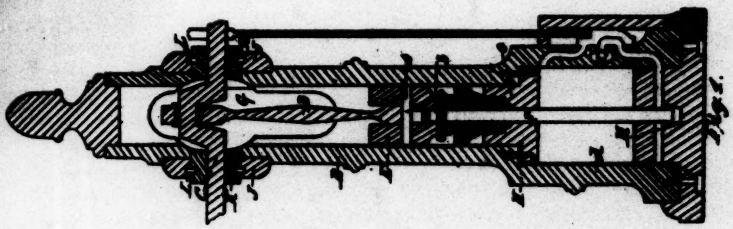


Fig 1.

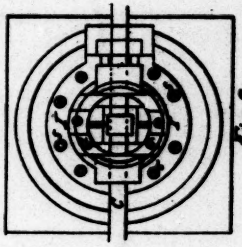


Fig 2.

Witnesses:
H. Mercer
M. Mercer

Inventor:
Gilbert Sanford

137 GELSTON SANFORD.

Improved Steam-Engine.

Specification forming part of Letters Patent No. 22981, dated Feb. 15, 1859.

To all whom it may concern :

Be it known that I, Gelston Sanford, of Poughkeepsie, in the county of Dutchess and State of New York, have invented a new and improved mode of constructing steam-engines, and I do hereby declare that the following is a full and exact description thereof, reference being had to the annexed drawings and to the letters of reference marked thereon, in which—

(Here follows diagram marked p. 136.)

Fig. 1 is a longitudinal section, and

Fig. 2 is a plan of the same.

Figs. 3, 4, and 5 are details of the cross-head, connecting rod, and piston-rod.

The nature of my invention relates to the elongating the cylinder, by which means it becomes a part of the frame, used for the support of the crank shaft, and so constructed that when bored out forms a guide and rest for the cross-head, to which the piston-rod and connecting rod are attached.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation. I make my cylinder of any desired length and size, A the cylinder, and B the elongated sides, which are also made tubular, but of less diameter than the cylinder, as the case may require, and of such length as may be necessary to accommodate the piston and connecting rods D and F. I make an opening or slant, as G, for crank and connecting rod to work in, and another below, as I, Fig. 2, for the convenience of getting at the cross-head and adjust it to the piston
138 and connecting rods, and also for adjusting the screws 1, 2, 3, Figs. 1, 2, and 3. The screws 1, Fig. 2, are for securing the upper head H to its place and for the convenience of readily getting at them in putting up or taking down the engine. I bore out the elongated part, on a line corresponding to the sides of the cylinder, which give a true line, for the cross-head E to work in, and in case it should wear to become loose I have so constructed the cross-head E that two of its sides are made adjustable.

Figs. 3, 4, and 5 shows the wedge pieces which serve as tighteners, and the manner of attaching the piston and connecting rods F and D, Fig. 5, being a cross-section of the cross-head E. The projections J are cast with the cylinder, and openings are left for the boxes K, which are secured by the keys L O — the stuffing box. I make all the connections in the ordinary way. The great advantages of this mode of construction are in the use of the cylindrical form of the cross-head E, working in a cylinder, making the whole more simple

and cheaper and less liable to get out of order, and also in the manner of attaching the upper head H. Having thus fully described my improved engine, what I claim as new and desire to secure by letters — is—

I claim the inside head H, in combination with the cross-head E and elongated cylinder A B, when constructed and operated in the manner and for the purposes above specified, as an article of manufacture.

GELSTON SANFORD.

Witness-:
J. H. MERRILL.
A. F. MOULDEN.

Ex'd: H. M. H.; E. & M.

140 UNITED STATES PATENT OFFICE.

JOHN B. ROOT, of New York, N. Y.

Improvement in Trunk-Engines.

Specification forming part of Letters Patent No. 57,190, dated August 14, 1866.

To all whom it may concern:

Be it known that I, John B. Root, of the city, county, and State of New York, have invented a new and useful improvement in trunk-engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, said drawing representing a central longitudinal vertical section of a trunk-engine with the improvement applied.

One of the difficulties encountered in trunk-engines of large size has been that of preserving a tight packing in the very large stuffing-boxes employed around the trunk.

The object of this invention is to obviate this difficulty; and to this end the invention consists in dispensing with stuffing-boxes for the packing of the trunks by the use of expanding packing-rings substantially like those used for piston-packing inserted into grooves in the trunk and working in cylindrical guides attached to the cylinder heads.

To enable others skilled in the art to apply my invention to use, I will proceed to describe it with reference to the drawing.

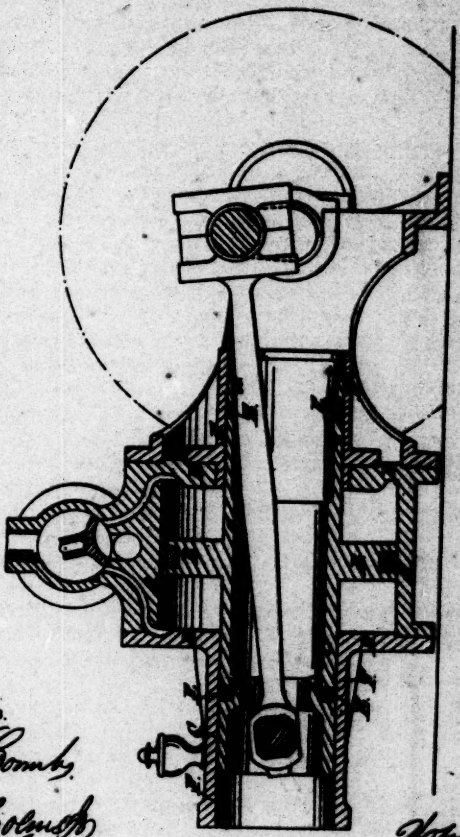
(Here follows diagram marked p. 139.)

A is the cylinder of the engine. B is the piston surrounding and attached to the trunk C, which extends through both cylinder-heads and works in two cylindrical guides, F F, attached to the cylinder-heads D D. These guides are concentric with the cylinder, and each of a length somewhat greater than the stroke of the piston, and are bored out truly and smoothly.

J. B. Root,

Reciprocating Steam Engine,

No. 57,190, Patented Aug. 14, 186[illegible]



Witnesses.

J. M. Comby.

Law. & Holcombe

Inventor.

John B. Root

E E are the expanding packing-rings, of metal, which constitute the principal feature of my invention, fitted into circumferential grooves *a a*, which are formed in the exterior of the trunk in such positions that during the stroke of the engine they will work within the guides F F, one within one and the other within the other of the said guides. These packing-rings may be of any known or suitable construction, and be pressed out to work steam-tight within the guides either by means of springs or by the pressure of the steam, which passes from the cylinder between the trunk and guides and enters the grooves *a a*; but I prefer to use rings of the construction which is the subject-matter of my application for letters patent allowed February 8, 1866. These rings, fitting and working steam-tight within the cylindrical bores of the guides F F, effectually prevent any steam from escaping from the cylinder between the trunk and the guides beyond the said rings.

A similar packing-ring and cylindrical guide may be used in trunk-engines in which the trunk passes through one cylinder-head only.

One advantage of arranging the packing-rings in grooves around the exterior of the trunk over their arrangement in stuffing-boxes attached to the cylinders consists in their permitting the use of longer cylindrical guides F F with a given length of trunk, and thereby enabling the engine with a given length of stroke and guide to be made considerably shorter. In explanation of this, let it be supposed that the rings were arranged near the outer ends of the cylindrical guides. The trunk would then have to be long enough to remain within the rings when the piston was at the end of the stroke farthest from either ring.

Another advantage of this arrangement of metallic packing-rings consists in the simplicity of construction provided for compared with the insertion of such rings into guides of a similar character to stuffing-boxes, such rings in the latter case requiring glands and bolts in the ends of the guides.

I do not confine myself to the particular construction of the packing-rings herein specified; but

What I claim as my invention, and desire to secure by letters patent, is—

The arrangement of the packing-rings within the trunk, in combination with the cylindrical guides F F, attached to the cylinder, substantially as and for the purpose herein specified.

JOHN B. ROOT.

Witnesses:
J. W. COOMBS,
A. LE CLERC.

141 At a stated term of the circuit court of the United States of America for the southern district of New York, in the second circuit, held at the United States court-rooms, in the city of New York, on Friday, the third day of February, in the year of our Lord one thousand eight hundred and eighty-eight.

Present: The Honorable Hoyt H. Wheeler, judge.

WILLIAM WRIGHT
vs.
DAVID G. YUENGLING, JR.

SAME
vs.
JOHNSTON BEGGS, Impl'd, etc.

The above-entitled causes coming on this day for final hearing upon pleadings and proofs, Mr. Andrew J. Todd is heard in behalf of complainant. Mr. Benjamin F. Lee is heard in behalf of defendants.

C. A. V.

142 Circuit Court of the United States, Southern District of New York.

WILLIAM WRIGHT
vs.
DAVID G. YUENGLING, JR.

SAME
vs.
JOHNSTON BEGGS.

In Equity. October Term, 1887.

These suits are brought upon alleged infringements of letters patent No. 144,818, dated Nov. 18, 1873, and granted to the orator for an improvement in frames for horizontal engines.

The specification describes an engine frame consisting of a cylinder head connected with a cylindrical cross-head guide, having openings giving access to the cross-head by a cylindrical piece having a circular opening in its upper side, giving access to the stuffing box of the cylinder head; of a trough-shaped piece connecting the other end of the cross-head guide with a base and raised on one side over the base to furnish a support for the crank-shaft,

143 and curved downward between the sides to make room for the connecting rod, and of a strengthening rib under the cross-head guide and its connections from the base to the cylinder-head. There are three claims. The first is for a horizontal engine frame, in which a cylinder for guiding the cross-head is combined with the cylinder head and semicircular connecting piece, substantially in the manner described. The second is for the combination in a horizontal engine frame of the guiding cylinder, base, and trough-like connection, and the third is for a horizontal engine frame composed of the cylinder head, guiding cylinder, connecting piece, trough, base, and web, all combined substantially in the manner described. The question is whether the defendants have taken any part of the orator's invention that is patentable and has been actually patented to him in this patent. A corporation with which the defendant in one case is connected as an officer has made and sold to the defendant in the other case who

has used an engine with a frame consisting of a cylindrical
144 cross-head guide, with openings in its sides, giving access to the cross-head and stuffing-box, bolted to the cylinder head, and of a trough-like connection between the guide and base, and of a base and a strengthening web like those of the orator's patent. The engine frame has no connecting piece between the cross-head guide and cylinder head separate from the guide, but the cross-head guide is bolted directly to the cylinder head, and the latter does not form any part of what is called the engine frame in the patent. Therefore the combination of the first claim is not to be found in that engine frame, and that claim is not infringed by it. The trough-like connection between the cross-head guide and base of the second claim performs nothing new nor anything different from other connections in that place, neither does the guide or the base of that claim do anything more or different from what other guides and bases in the same relations had previously done, and these parts together do nothing new or anything in any new way or with any
145 different effect from what similar parts had for a long time previously done. If anything new is involved in this combination it consists in the form of the respective parts or some of them, and such new form is not covered by this patent. Therefore this claim does not cover any patentable invention and is not valid. Machine Co. *vs.* Murphy, 97 U. S., 120.

The third claim covers all the parts of a horizontal engine frame, including the cylinder head, as an element in combination. As the engine frame of the defendants does not take in the cylinder head as a part of it after the manner of the patent, and has not the connecting piece of the patent between the cross-head guide and cylinder head, it does not appear to infringe that claim; and, generally, steam engines have had and must have rigid frames connecting the working cylinders with the crank shafts to keep them in their proper relative positions, and horizontal engines have had and must have bases to sustain the parts. The cross-head guide usu-
146 ally lies in the direction of the frame, and is connected with or forms a part of it. Cylindrical guides were not new with this invention, and those composed of bars for slides were open, affording access to the cross-heads and to the stuffing-boxes of the cylinder heads. There would not appear to be any patentable invention in leaving openings for such access in cylindrical guides. The orator added no new part but the connecting piece, which the frame of the defendants does not have. The parts made use of in the frame of the defendants operate precisely in the same manner that similar parts operated before his invention, and accomplish precisely the same result. The form given by him to several of the parts appears to be taken, but the form was not patented. The patent covers only mechanical operation, and does not appear to be valid to cover anything of that which has been taken. Estey *vs.* Burdett, 109 U. S., 633; Thatcher Heating Co. *vs.* Buotis, 121 U. S., 286.

On any view which the case is capable of the patent does
147 not appear to be valid in any part covering the engine frame of the defendants, if at all.

Let there be a decree dismissing the bill of complaint with costs.
(S'g'd) HOYT H. WHEELER.

ANDREW J. TODD,
For Plaintiffs.
BENJAMIN F. LEE,
For Defendants.

(Endorsed:) Circuit court of the U. S., southern dist. of New York. William Wright *vs.* David G. Yuengling, Jr. Same *vs.* Johnston Beggs. Decision. Wheeler, J. (File mark:) U. S. circuit court. Filed Feb. 13, 1888. Timothy Griffith, clerk.

148 At a stated term of the circuit court of the United States of America for the southern district of New York, in the second circuit, held at the United States court-rooms, in the city of New York, on —, the — day of February, in the year of our Lord one thousand eight hundred and eighty-eight.

Present: The Honorable Hoyt H. Wheeler, judge.

WILLIAM WRIGHT
vs.
DAVID G. YUENGLING, Jr.

This cause came on to be heard at the October, 1887, term of this court, and was argued by A. J. Todd, of counsel for complainant, and B. F. Lee, Esq., of counsel for defendant; and thereupon and upon consideration thereof it is ordered, adjudged, and decreed that the second claim of the letters patent of the United States granted to William Wright for improvement in frames for horizontal engines, dated November 18th, 1873, number 144,818, is void, because it does not embrace within said claim subject-matter properly patentable under the laws of the United States relating to letters patent for mechanical inventions.

And it is further ordered, adjudged, and decreed that the above-named defendant, David G. Yuengling, Jr., has not infringed the first or third claims of said letters patent.

149 And it is further ordered, adjudged, and decreed that the bill of complaint herein be, and the same hereby is, dismissed, and that the defendant, David G. Yuengling, Jr., recover of the plaintiff his costs herein, to be taxed.

(Signed) HOYT H. WHEELER.

(Endorsed:) U. S. circuit court, southern district of New York. William Wright *vs.* David G. Yuengling, Jr. Final decree dismissing bill. Turner, Lee & McClure, solicitors for defendant, 20 Nassau street, New York. (File mark:) U. S. circuit court. Filed Aug. 1, 1888. John A. Shields, clerk.

150 United States Circuit Court, Southern District of New York.

WILLIAM WRIGHT
vs.
DAVID G. YEUNGLING, Jr.

It is hereby stipulated and consented that the clerk of this court send all of the models, exhibits, and patent exhibits used on the final hearing in this case to the clerk of the United States Supreme Court, at Washington, D. C., to be used at the hearing of the appeal taken in this cause to the United States Supreme Court, at or about the date of the hearing of said appeal, and that the clerk of the United States Supreme Court be requested to return such exhibits to the clerk of this court after the decision of such appeal.

(S'g'd) A. J. TODD, *Compl't's Solicitor.*
(S'g'd) TURNER, LEE & McCLURE,
Sol'rs for Def't in U. S. Circuit Court for the S. D. of N. Y.

(Endorsed:) U. S. circuit court, south. dist. of N. Y. Wil-
151 liam Wright *vs.* David G. Yuengling. Stipulation 1. (File mark:) U. S. circuit court. Filed Aug. 16, 1888. John A. Shields, clerk.

152 Circuit Court of the United States, Southern District of New York.

WILLIAM WRIGHT
vs.
DAVID G. YUENGLING, Jr. } In Equity.

It is hereby stipulated that the foregoing may constitute the record to be sent by the clerk of this court to the clerk of the Supreme Court of the United States on the appeal to said Supreme Court, without prejudice to any motion hereafter to be made to correct the same if any errors shall be contained therein.

New York, August 27, 1888.

(S'g'd) A. J. TODD, *Sol'r for Complainant.*
(S'g'd) TURNER, LEE & McCLURE,
Solicitors for Defendant Above Named in the U. S. Circuit Court for the Southern District of New York.

(Endorsed:) (File-mark:) U. S. circuit court. Filed Sept. 4, 1888. John A. Shields, clerk.

153 United States Circuit Court, Southern District of New York.

WILLIAM WRIGHT
vs.
DAVID G. YUENGLING, JR.

To the honorable the Supreme Court of the United States:

The appeal of William Wright, complainant and appellant, respectfully showeth that on the nineteenth day of March, 1885, the

above-named complainant and appellant filed his bill of complaint in the circuit court of the United States for the southern district of New York against the above-named defendant and appellee to enjoin and restrain the said defendant and appellee from infringing certain letters patent of the United States for improvement in frames for horizontal engines, and also praying for an account of profits and assessment of damages arising from said infringe-
154 ment; that a subpœna issued out of said circuit court and was duly served upon said defendant and appellee; that the said defendant and appellee filed his answer to said bill of complaint, to which the complainant and appellant filed a general replication; that such proceedings were had in the said cause that on the first day of August, 1888, a final decree was entered therein dismissing the bill of complaint; and the complainant and appellant, feeling aggrieved thereby, hereby appeals therefrom to the Supreme Court of the United States, and he prays that this his appeal may be allowed, and that a transcript of the records, pleadings, proceedings, and evidence in the cause, duly authenticated, may be sent to the Supreme Court of the United States without delay, and that the said Supreme Court may proceed to hear the said cause anew, and that the said decree may be reversed or such other decree made as to the said Supreme Court shall seem just.

(Signed) A. J. TODD,
Complainant's Solicitor.

The foregoing appeal is allowed.
155 New York, August 13, 1888.
(Signed) WM. J. WALLACE.

(Endorsed:) U. S. circuit court, south. dist. of New York. William Wright *vs.* David G. Yuengling, Jr. Petition of appeal to U. S. Supreme Court. Service of within petition hereby admitted this 13th day of August, 1888. (S'g'd) Turner, Lee & McClure, sol'rs for def't in circuit court U. S. for S. D. of N. Y. (File-mark:) U. S. circuit court. Filed Aug. 14, 1888. John A. Shields, clerk.

156 Know all men by these presents that I, William S. Newton, of the city of Brooklyn, in the county of Kings and State of New York, am held and firmly bound unto David G. Yuengling, Jr., of the city, county, and State of New York, in the sum of four hundred dollars, to be paid to the said David G. Yuengling, Jr., his executors, administrators, or assigns; for which payment, well and truly to be made, I bind myself, my heirs, executors, and administrators, by these presents.

Sealed with my seal and dated the 11th day of August, 1888.

Whereas at a circuit court of the United States within and for the southern district of New York, in a suit in equity pending in said court between William Wright, complainant, and David G. Yuengling, Jr., defendant, a decree was rendered against the said complainant; and the said complainant having obtained an appeal to remove the said cause to the Supreme Court of the United States to

reverse the decree in the aforesaid suit, and a citation directed
157 to the said David G. Yuengling, Jr., citing and admonishing him to be and appear at the October term, 1888, of the Supreme Court of the United States, to be held at Washington, to wit, on the second Monday of October, 1888:

Now, therefore, the condition of the above obligation is such that if the said William Wright shall prosecute his said appeal to effect and answer all damages and costs if he fails to make his plea good, then the above obligation to be null and void; otherwise to remain in full force and virtue.

(Signed) WILLIAM S. NEWTON.

In presence of—
(S'g'd) ANDREW M. TODD.

STATE OF NEW YORK, }
City and County of New York, } *ss:*

On the eleventh day of August, 1888, before me personally came William S. Newton, to me known and known to me to be the individual described in and who executed the foregoing bond,
158 and he acknowledged that he executed the same.

(Signed) ANDREW M. TODD,
[NOTARIAL SEAL.] *Notary Public, N. Y. Co.*

STATE OF NEW YORK, }
City and County of New York, } *ss:*

William S. Newton, being duly sworn, says that he is the person named in the within bond; that he resides at No. 256 Clifton place, in the city of Brooklyn, and he is engaged in business in the city of New York, at No. 13 Spruce street; that he is a freeholder in the State of New York, and is worth the sum of twenty-five thousand dollars besides property exempt by law from execution and over and above all his debts and liabilities.

(S'g'd) WILLIAM S. NEWTON.

Sworn to before me this 11th day of August, 1888.

ANDREW M. TODD,
[NOTARIAL SEAL.] *Notary Public, N. Y. Co.*

159 (Endorsed:) Approved as to form and sufficiency this 13th day of August, 1888. (S'g'd) Turner, Lee & McClure, solicitors for defendant in U. S. circuit court for the southern district of New York: U. S. circuit court, south. dist. of New York. William Wright *vs.* David G. Yuengling, Jr. Bond on appeal to U. S. Supreme Court. Approved. (S'g'd) Wm. J. Wallace. Aug. 13, 1888. A. J. Todd, solicitor for complainant and appellant. (File-mark:) U. S. circuit court. Filed *filed* Aug. 14, 1888. John A. Shields, clerk.